

1-1**Practice: Word Problems*****A Plan for Problem Solving***

MAGAZINES For Exercises 1 and 2, use the table that shows the costs of several popular magazines.

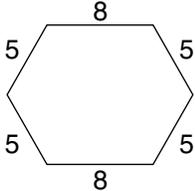
Costs of Popular Magazines		
Magazine	Cost of Yearly Subscription	Cost of a Single Copy
<i>Teen World</i>	\$9.98 (12 issues)	\$3.25
<i>Soccer World</i>	\$19.97 (6 issues)	\$4.99
<i>Book Nation</i>	\$19.98 (12 issues)	\$2.99
<i>TV Weekly</i>	\$46.28 (52 issues)	\$1.95

<p>1. How much could you save by buying <i>Teen World</i> with a yearly subscription rather than 12 single copies?</p>	<p>2. Which of the magazines saves you the most money by purchasing a yearly subscription instead of an equivalent number of single copies? How much will you save?</p>
<p>3. BICYCLING Adriana can ride her bicycle 6 miles in one hour. How long will it take her to ride 15 miles?</p>	<p>4. BASKETBALL At Johnson Middle School an average of 500 people attended each of the 15 home basketball games. If admission was \$3 per person, about how much money was collected in all?</p>
<p>5. THEATER A local theater has floor seating, balcony seating, and box seating. If the theater contains 2,500 seats with 425 seats in the balcony and 215 box seats, how many seats are on the floor?</p>	<p>6. POPCORN Janelle plans to buy three boxes of popcorn at the movies for herself and two friends. If each box costs \$1.95, how much change will she receive when she pays with a ten-dollar bill?</p>

1-2**Practice: Word Problems*****Powers and Exponents***

<p>1. SPACE SHUTTLE The cost of each flight of the Space Shuttle is about \$10,000,000. Write this amount in exponential form.</p>	<p>2. ANIMALS The African bush elephant is the largest land animal and weighs about 8 tons. Write this amount in exponential form.</p>
<p>3. VOLUME To find the volume of a rectangular box you multiply the length times the width times the height. In a cube all sides are the same length. If the cube has length, width, and height of 6 inches, write the volume as a product. Then write it in exponential form.</p>	<p>4. SCIENCE A certain type of cell doubles every hour. If you start with one cell, at the end of one hour you would have 2 cells, at the end of two hours you have 4 cells, and so on. The expression $2 \times 2 \times 2 \times 2 \times 2$ tells you how many cells you would have after five hours. Write this expression in exponential form; then evaluate it.</p>
<p>5. MATH Write 625 using exponents in as many ways as you can.</p>	<p>6. PREFIXES Many prefixes are used in mathematics and science. The prefix giga in gigameter represents 1,000,000,000 meters. Write this prefix as a power of ten.</p>
<p>7. LIBRARY The school library contains 9^4 books. How many library books are in the school library?</p>	<p>8. HOT DOGS The concession stand at the county fair sold 6^3 hot dogs on the first day. How many hot dogs did they sell?</p>

1-3**Practice: Word Problems****Order of Operations**

<p>1. FOOTBALL The middle school team scored three field goals worth three points each and two touchdowns worth six points each, including extra points. Write a numerical expression to find the team's score. Then evaluate the expression.</p>	<p>2. BOOKS Juan goes to the schoolbook fair where paperback books are \$1.50 and hardback books are \$3.00. Juan buys 5 paperback and 2 hardback books. Write a numerical expression to find how much Juan paid for the books. Then evaluate the expression.</p>
<p>3. GEOMETRY The perimeter of a hexagon is found by adding the lengths of all six sides of the hexagon. For the hexagon below write a numerical expression to find the perimeter. Then evaluate the expression.</p> 	<p>4. MONEY Aisha bought school supplies consisting of 6 spiral notebooks costing \$0.39 each, 2 packages of pencils at \$0.79 each, and a 3-ring binder for \$1.99. Write an expression to find the total amount Aisha spent on school supplies. Then evaluate the expression.</p>
<p>5. REASONING Use the order of operations and the digits 2, 4, 6, and 8 to create an expression with a value of 2.</p>	<p>6. NUMBER SENSE Without parentheses, the expression $8 + 30 \div 2 + 4$ equals 27. Place parentheses in the expression so that it equals 13; then 23.</p>
<p>7. MONEY Tyrone bought 5 postcards at \$0.55 each and a set of postcards for \$1.20. Write an expression to find the total amount Tyrone spent on postcards. Then evaluate the expression.</p>	<p>8. DINING Mr. Firewalks took his family out to eat. They ordered 3 meals costing \$8.99 each, 2 sodas at \$1.50 each, and 1 glass of tea for \$1.25. Write an expression to find the total amount the Firewalks family spent on dinner before taxes and tip. Then evaluate the expression.</p>

1-4**Practice: Word Problems****Algebra: Variables and Expressions**

<p>1. FIELD TRIP The seventh grade math classes are going on a field trip. The field trip will cost \$7 per student. Write an expression to find the cost of the field trip for s students. What is the total cost if 26 students go on the trip?</p>	<p>2. SOCCER Jason earns \$20 per game as a referee in youth soccer games. Write an expression to find how much money Jason will earn for refereeing any number of games. Let n represent the number of games Jason has refereed. How much will he earn for refereeing 6 games?</p>
<p>3. PROFIT The expressions $c - e$, where c stands for the money collected and e stands for the expenses, is used to find the profit from a basketball concession. If \$500 was collected and expenses were \$150, find the profit for the concession.</p>	<p>4. SAVINGS Kata has a savings account that contains \$230. She decides to deposit \$5 each month from her monthly earnings for baby-sitting after school. Write an expression to find how much money Kata will have in her savings account after x months. Let x represent the number of months. Then find out how much she will have in her account after 1 year.</p>
<p>5. MONEY Mr. Wilson has \$2,500 in his savings account and m dollars in his checking account. Write an expression that describes the total amount that he has in both accounts.</p>	<p>6. ANIMALS Write an expression to represent the total number of legs on h horses and c chickens. How many legs are there in 5 horses and 6 chickens?</p>
<p>7. T-SHIRTS The band wants to order T-shirts. The T-shirts cost \$15 each plus a shipping fee of \$10. Write an expression to find the total cost of c T-shirts.</p>	<p>8. TEMPERATURE The expression $\frac{9}{5}C + 32$, where C stands for temperature in degrees Celsius, is used to convert Celsius to Fahrenheit. If the temperature is 20 degrees Celsius, find the temperature in degrees Fahrenheit.</p>

1-5**Practice: Word Problems****Algebra: Equations**

<p>1. GAS MILEAGE Mr. Moseley's car has a 20-gallon gas tank. It took 14 gallons of gas to fill his tank. Use the equation $14 + g = 20$ to find the number of gallons g that he had before he filled his tank with gas.</p>	<p>2. PAINTING Latisha earned \$5 an hour painting for her dad. If she made \$40 last week, use $5h = 40$ to find how many hours h she painted.</p>
<p>3. LUMBER Mrs. Garcia had a piece of board that was 15 feet long. She cut off 6.5 feet. Use the equation $6.5 + \ell = 15$ to determine how much of the board ℓ she has left.</p>	<p>4. MAGAZINES Mahpee was selling magazine subscriptions. He earned \$5 plus \$0.50 for each subscription he sold. If Mahpee earned \$25, use the equation $25 = 5 + 0.50n$ to find the number of subscriptions n he sold.</p>
<p>5. TIRES The cost of a car tire is \$45 plus \$10 per order regardless of the number of tires purchased. If Mrs. Sato places an order for \$190, use the equation $45t + 10 = 190$ to find the number of tires t she purchased.</p>	<p>6. AREA If the area of a rectangle is 30 square centimeters and the length is 6 centimeters, use the equation $30 = 6w$ to find the width w of the rectangle.</p>
<p>7. SUPPLIES The Jones Middle School had \$4,000 to spend on office supplies. They had already spent \$1,250. Use the equation $1,250 + d = 4,000$ to find how much money d the school had left for other supplies.</p>	<p>8. PENCILS Mi-Leng spent 90 cents on 6 pencils. Use the equation $90 = 6c$ to find the cost c of each pencil.</p>

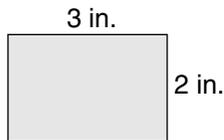
1-6**Practice: Word Problems****Algebra: Properties**

1. MUSIC Mr. Escalante and Mrs. Turner plan to take their music classes to a musical revue. Tickets cost \$6 each. Mr. Escalante's class needs 22 tickets, and Mrs. Turner's class needs 26 tickets. Use the Distributive Property to write a sentence to express how to find the total cost of tickets in two ways.

2. SAVINGS Mrs. Perez was looking at her bank account statement. She noticed that her beginning balance was \$500, and she had added nothing to her account. What was the ending balance on her statement? What property did you apply?

3. ADDITION Mr. Brooks was working on addition using dominos with a group of 1st graders. When picking the domino with 3 dots on one end and 5 dots on the other, some students read, "3 plus 5 equal 8" while others read it as "5 plus 3 equals 8." What property were these children using? Explain.

4. AREA Aleta noticed that for the rectangle below she could either multiply 2 times 3 or 3 times 2 to get its area of 6 square inches. What property allows her to do this?



5. NUMBER CUBES Students in Mr. Rivas' class were practicing their multiplication skills by rolling three 6-sided number cubes. Wapi rolled a 2, a 3, and a 5 on his roll. He multiplied the three numbers as follows using the order of operations: $(2 \times 3) \times 5 = 30$. Write another way Wapi could have performed the multiplication without changing the order of the numbers. State the property you used.

6. FACTS Bik was working on memorizing her multiplication facts. She noticed that anytime she multiplied a number by 1, she got the same number she started with. What property allows this to be true?

7. MONEY Mei was trying to figure out the cost of 4 boxes of cereal for \$2.25 each. Write a sentence to show Mei an easy way to do her calculations. What property did you apply to help her?

8. WALKING Jacob walked 3 blocks to Ping's house, then 5 blocks to Jamal's house. Write a sentence to show that the distance from Ping's to Jamal's is the same as the return walk home. Name the property illustrated in your sentence.

1-7**Practice: Word Problems****Sequences**

<p>1. NUMBERS The multiples of two form a sequence as follows: 2, 4, 6, 8, 10, 12, 14, 16, What type of sequence do you see? What about the multiples of three? Four? Five?</p>	<p>2. OLYMPICS The summer Olympics occur every four years. If the last summer Olympics happened in 2000, when are the next three times that it will occur? What type of sequence do the Olympic years form?</p>
<p>3. BABY-SITTING Tonya charges \$3.50 per hour to baby-sit. The sequence \$3.50, \$7.00, \$10.50, \$14.00, ... represents how much she charges for each subsequent hour. For example, \$10.50 is the third term that represents how much she charges for 3 hours. What are the next three terms in the sequence? How much does she charge for 7 hours of baby-sitting?</p>	<p>4. RECTANGLES Suppose you start with 1 rectangle and then divide it in half. You now have 2 rectangles. You divide each of these in half, and you have 4 rectangles. The sequence for this division is 1, 2, 4, 8, 16, ... rectangles after each successive division. What type of sequence results?</p>
<p>5. BACTERIA Three bacteria are in a dish. Each hour the number of bacteria multiplies by four. If at the end of the first hour there are 12 bacteria, how many bacteria are there at the end of the next three hours? What type of sequence results?</p>	<p>6. ENROLLMENT The enrollment at Grove Middle School is expected to increase by 40 students each year for the next 5 years. If their current enrollment is 600 students, find their enrollment after each of the next 5 years.</p>
<p>7. SALARY Mrs. Malone's current salary is \$1,500. She expects it to increase \$100 per year. Write the first 6 terms of a sequence that represents her salary. The first term should be her current salary. What does the sixth term represent?</p>	<p>8. FIBONACCI The Fibonacci sequence is named after Leonardo Fibonacci who first explored it. Look at the Fibonacci sequence below and describe its pattern. Is it arithmetic, geometric or neither? 1, 1, 2, 3, 5, 8, 13, 21, 34, ...</p>

1-8**Practice: Word Problems*****Measurement: The Metric System***

<p>1. RUNNING Each morning Carlos runs 1.5 kilometers. How many meters did he run?</p>	<p>2. AVIATION A helicopter was flying 800 meters above the ground. How many kilometers above the ground was it flying?</p>
<p>3. SODA A soda can contains 355 milliliters of liquid. How many liters of liquid does it contain?</p>	<p>4. CONSTRUCTION The ceilings of most classrooms are about 2.5 meters above the floor. How many centimeters high is the ceiling?</p>
<p>5. FENCING Gerri's garden is 1,270 centimeters around the edges. How many meters of fencing material does she need to enclose her garden?</p>	<p>6. GARDENING Mr. Chou's lawn sprinkler sprays about 150 liters of water each hour. How many kiloliters of water does it spray?</p>
<p>7. NUTRITION For 11- to 14-year-olds, the Recommended Dietary Allowance (RDA) for protein is about 60 grams daily. How many milligrams do they need daily?</p>	<p>8. MEASUREMENT A measure of one pound is equivalent to about 454 grams. How many kilograms are in one pound? How many milligrams?</p>

1-9**Practice: Word Problems****Scientific Notation**

<p>1. ICEBERG The biggest iceberg ever seen that had split off the Ross Ice Shelf in Antarctica happened during the spring of 2000. It was estimated to weigh about 4,000,000,000,000 tons. Write its weight in scientific notation.</p>	<p>2. PLANETS The average distance between Earth and the Sun is 92,960,000 miles. Write this distance in scientific notation.</p>
<p>3. POPULATION The population of Texas was about 20,900,000 in the 2000 U.S. census. Write this number in scientific notation.</p>	<p>4. BASEBALL Willie Mays hit 6.6×10^2 career home runs. Write 6.6×10^2 in standard form.</p>
<p>5. EARTH The mass of Earth is about 6,580,000,000,000,000,000 tons. Write this value in scientific notation.</p>	<p>6. LIGHT The speed of light is about 2.998×10^8 meters per second or about 1.86×10^5 miles per second. Write these values in standard form.</p>
<p>7. WEALTH In 1999, the wealthiest man in the world's assets were estimated at about \$90,000,000,000. Write this value in scientific notation.</p>	<p>8. POPULATION In 2001, the population of the world was about 6,160,000,000. The projected population of the world for the year 2025 is about 7,840,000,000. Write these values in scientific notation.</p>

2-1

Practice: Word Problems

Frequency Tables

FAVORITE COLORS For Questions 1–3, use the table below. It shows the favorite colors of the students in Mr. Swatzky’s class.

Favorite Colors of Mr. Swatzky’s Students									
B	R	R	O	B	Y	G	G	P	B
Y	B	B	Y	R	O	B	R	B	Y
G	B	O	Y	B	Y	G	G	G	G
P	Y	R	R	G					

B = blue, R = red, G = green, Y = yellow,
O = orange, P = purple

HOLIDAYS For Questions 4–6, use the table below. It shows the number of holidays in each month of 2003.

2003 Holidays			
3	5	5	5
4	4	1	0
2	6	5	2

- | | |
|--|---|
| <p>1. Make a frequency table of the data.</p> | <p>2. If one student changed his or her vote from blue to yellow, what would be the favorite color of most students?</p> |
| <p>3. If one student changed his or her vote from red to purple, what would be the favorite color of the fewest students?</p> | <p>4. What is wrong with using the intervals 1–2, 3–4, and 5–6 to represent the data in a frequency table?</p> |
| <p>5. Make a frequency table of the data.</p> | <p>6. What is the interval and scale of your frequency table from Question 5?</p> |

2-2

Practice: Word Problems

Making Predictions

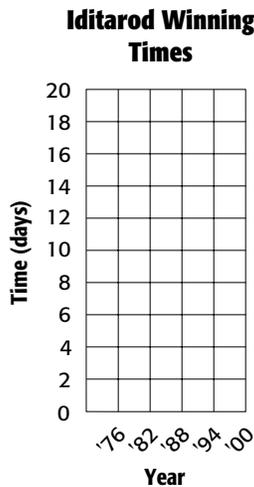
IDITAROD RACE For Exercises 1 and 2, use the data in the table. It shows the number of days it took the winner to complete the Iditarod race.

Iditarod Race Winning Times	
Year	Winning Time (rounded to the nearest day)
1976	19
1982	16
1988	11
1994	11
2000	9

ENTERTAINMENT For Exercises 3 and 4, use the table. It shows the gross amount collected during several Broadway seasons.

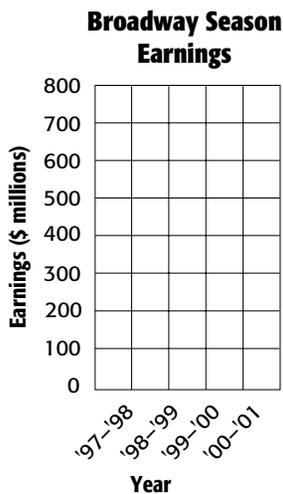
Broadway Season Earnings	
Year	Earnings (\$ million)
1997–1998	558
1998–1999	588
1999–2000	603
2000–2001	666

1. Make a line graph of the data.



2. Use your line graph from Exercise 2 to predict the winning time in 2006, if the trend continues.

3. Make a scatter plot of the data.



4. Use your scatter plot to predict about how much money a Broadway season will gross in 2005–2006, if the trend continues.

2-4**Practice: Word Problems*****Mean, Median, and Mode***

SCHOOL For Exercises 1–6, use the table below. It shows the number of times per day that students go to their lockers.

Student Locker Visits							
2	2	0	1	2	2	3	4
0	5	2	5	2	5	2	4
2	4	6	4	5	6	5	6
2	2	0	1	4	6	10	2

<p>1. Make a frequency table of the data.</p>	<p>2. What is the range of the data?</p>
<p>3. Find the mean, median, and mode of the data. Round to the nearest tenth if necessary.</p>	<p>4. Would the mean, median, or mode best represent the data? Explain.</p>
<p>5. Explain why the mean does not best represent the data.</p>	<p>6. If the value 10 were dropped from the data, find the median and the mode of the remaining data.</p>

2-5**Practice: Word Problems*****Stem-and-Leaf Plots***

ENDANGERED SPECIES For Exercises 1–6, use the table below. It shows the number of endangered species in the U.S.

Endangered Species in U.S.			
Group	Number of Species	Group	Number of Species
mammals	63	clams	61
birds	78	snails	20
reptiles	14	insects	33
amphibians	10	arachnids	12
fishes	70	crustaceans	18

1. Make a stem-and-leaf plot of the data.	2. What group has the greatest number of endangered species in the U.S.?
3. What group has the least number of endangered species in the U.S.?	4. What is the range of the data?
5. Use your stem-and-leaf plot to determine the median and mode.	6. How many groups have less than 30 endangered species in the U.S.?

2-6**Practice: Word Problems*****Box-and-Whisker Plots***

SOCCER For Exercises 1–6, use the table below. It shows the number of wins in a recent major league soccer season.

Major League Soccer Wins					
16	13	7	8	10	4
14	13	11	5	16	13

<p>1. Find the lower extreme, LQ, median, UQ, and upper extreme.</p>	<p>2. Construct a box-and-whisker plot of the data in the table.</p>
<p>3. What fraction of the data is greater than 7.5?</p>	<p>4. What fraction of the data is between 7.5 and 13.5?</p>
<p>5. Determine the interquartile range.</p>	<p>6. Use the interquartile range to determine the limits for the outliers. Are there any outliers?</p>

2-7

Practice: Word Problems

Bar Graphs and Histograms

PUPPIES For Exercises 1 and 2, use the table below. It shows the results of a survey in which students were asked what name they would most like to give a new pet puppy.

Name	Votes
Max	15
Tiger	5
Lady	13
Shadow	10
Molly	9
Buster	2

EARTH SCIENCE In Exercises 3–6, use the table below. It shows the highest wind speeds in 30 U.S. cities.

Highest Wind Speeds (mph)									
52	75	60	80	55	54	91	60	81	58
53	73	46	76	53	46	73	46	51	49
57	58	56	47	65	49	56	51	54	51

<p>1. Make a bar graph to display the data.</p> <p style="text-align: center;">Favorite New Puppy Names</p> <div style="border: 1px solid black; height: 150px; margin: 10px auto; width: 80%;"></div>	<p>2. Use your bar graph from Exercise 1. Compare the number of votes the name Shadow received to the number of votes the name Tiger received.</p>
<p>3. Make a histogram of the data.</p> <p style="text-align: center;">Highest Wind Speeds</p> <div style="border: 1px solid black; height: 150px; margin: 10px auto; width: 80%;"></div>	<p>4. What is the top wind speed of most of the cities?</p>
<p>5. How many cities recorded wind speeds of 80 miles per hour or more?</p>	<p>6. How many cities recorded their highest wind speeds at 60 miles per hour or more?</p>

2-8**Practice: Word Problems*****Misleading Statistics***

QUIZ SCORES For Exercises 1 and 2, use the data shown in the table below. The table shows the quiz grades for Ms. Andrey's and Mr. Luna's classes.

Quiz Scores	
Ms. Andrey's Class	Mr. Luna's Class
10	20
15	20
25	25
25	29
12	26

BOOK SALES For Exercises 3 and 4, use the table below. It shows the number of books sold each day for 20 days.

Book Sales Per Day			
23	18	23	15
24	16	0	11
19	10	13	17
12	23	11	16
36	24	12	27

1. Ms. Andrey claims the average score on a quiz in her class was 25. Mr. Luna claims the average score on a quiz in his class is 25. Explain how they arrived at these figures.

2. What additional information could be useful in analyzing the data?

3. Find the mean, median, and mode of the data. Which measure of central tendency would be misleading in describing the book sales? Explain.

4. Which value would most accurately describe the data? Explain.

3-1**Practice: Word Problems*****Integers and Absolute Value***

<p>1. DEATH VALLEY The lowest point in the United States is Death Valley in California. Its altitude is 282 feet below sea level. Write an integer to represent the altitude of Death Valley.</p>	<p>2. RAIN A meteorologist reported that in the month of April there were 3 inches more rainfall than normal. Write an integer to represent the amount of rainfall above normal in April.</p>
<p>3. ARCHIMEDES A famous mathematician and physicist named Archimedes was born in 287 B.C. Write an integer to express the year of his birth.</p>	<p>4. TEMPERATURE In our world's tropical rain forests, the average temperature of every month is 64 degrees above zero or higher. Write an integer to express this temperature.</p>
<p>5. STOCK MARKET A certain stock gained 5 points in one day and lost 4 points the next day. Write integers to represent the stock's gains and losses for the two days.</p>	<p>6. ALTITUDE An airplane pilot changed his altitude by 100 meters. Describe what this could mean.</p>

3-2**Practice: Word Problems****Comparing and Ordering Integers**

HISTORY OF WRITING For Exercises 1 and 2, use the table below. It shows important events in the history of writing.

Event	Aprox. Year
The <i>Iliad</i> and the <i>Odyssey</i> are composed by Homer.	700 BC
T'sai Lun invents paper.	105 AD
Date of oldest existing papyrus	2200 BC
Ovid wrote <i>Metamorphosis</i> .	5 AD
Torah is compiled.	450 BC
Metal type developed in Korea	1241 AD

EXTREME TEMPERATURES For Exercises 3–5, use the table below. It shows the extreme temperatures for four states. Temperatures are in degrees Fahrenheit.

Extreme Temperatures (°F)

State	Highest	Lowest
Alabama	104	3
Nebraska	118	-47
Maine	101	-30
Florida	109	-2

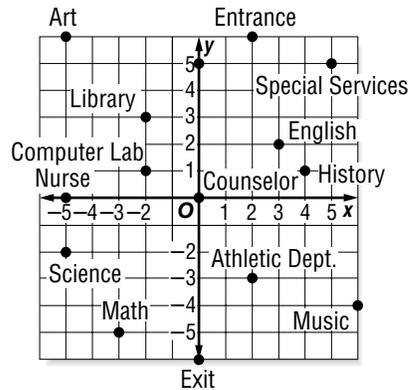
1. Write each year as an integer.	2. Order the integers from Exercise 1 from least to greatest. Write a sentence describing the earliest and most recent events in the table.
3. Arrange the highest temperatures from greatest to least.	4. What is the median low temperature for these four states?
5. Nebraska's lowest temperature was -47°F , and Maine's lowest temperature was -30°F . Write a true statement using the two temperatures with the symbol $>$ or $<$.	6. MONEY Mr. Firewalks pays close attention to how much money is in his checking account. One week he deposited \$230, spent \$15 on a lunch, and loaned \$25 to a friend. Write each transaction as an integer, and list them from least to greatest.

3-3

Practice: Word Problems

The Coordinate Plane

SCHOOL For Exercises 1–4, use the coordinate plane at the right. It shows a map of the rooms in a junior high school.



<p>1. Thalia is in the room located at $(-2, 1)$. What room is she in? Describe in words how to get from the origin to this point.</p>	<p>2. Thalia’s next class is 8 units to the right and 5 units down on the map from where she is now. In what room is Thalia’s next class? Find the ordered pair that represents the location of that room.</p>
<p>3. Tyrone is in the Art room, but his next class is in the History room. Give Tyrone directions on how to get to the History room.</p>	<p>4. On the map, which classrooms are located in the third quadrant? Describe the coordinates of all points in the third quadrant.</p>
<p>5. NEIGHBORHOOD Delsin made a map of his neighborhood in such a way that each intersection is a point on a coordinate plane. Right now, Delsin stands at point $(-4, -3)$. Give the ordered pair of where he will be if moves 5 units to the right and 7 units up on the map.</p>	<p>6. NEIGHBORHOOD Refer to Exercise 5. In which quadrant is Delsin when he is done walking? Describe this quadrant.</p>

3-4**Practice: Word Problems*****Adding Integers***

Write an addition expression to describe each situation. Then find each sum.

<p>1. FOOTBALL A team gains 20 yards. Then they lose 7 yards.</p>	<p>2. MONEY Roger owes his mom \$5. He borrows another \$6 from her.</p>
<p>3. GOLF Juanita's score was 5 over par on the first 9 holes. Her score was 4 under par on the second 9 holes.</p>	<p>4. HOT AIR BALLOON A balloon rises 340 feet into the air. Then it descends 130 feet.</p>
<p>5. CYCLING A cyclist travels downhill for 125 feet. Then she travels up a hill 50 feet.</p>	<p>6. AIRPLANE A plane descends 1,200 feet. Then it descends another 500 feet.</p>

3-5**Practice: Word Problems*****Subtracting Integers*****Subtract.**

<p>1. FOOTBALL A team gained 5 yards on their first play of the game. Then they lost 6 yards. Find the total change in yardage.</p>	<p>2. CHECKING Your checking account is overdrawn by \$50. You write a check for \$20. What is the balance in your account?</p>
<p>3. TEMPERATURE The average temperature in Calgary, Canada, is 22°C in July and -11°C in January. Find the range of the highest and lowest temperatures in Calgary.</p>	<p>4. ROLLER COASTER A roller coaster begins at 90 feet above ground level. Then it descends 105 feet. Find the height of the coaster after the first descent.</p>
<p>5. SAVINGS Sonia has \$235 in her savings account. She withdraws \$45. What is left in her savings account?</p>	<p>6. BEACH Wai and Kuri were digging in the sand at the beach. Wai dug a hole that was 15 inches below the surface, and Kuri dug a hole that was 9 inches below the surface. Find the difference in the depths of their holes.</p>

3-6**Practice: Word Problems*****Multiplying Integers*****Multiply.**

<p>1. TEMPERATURE Suppose the temperature outside is dropping 3 degrees each hour. How much will the temperature drop in 8 hours?</p>	<p>2. DIVING A deep-sea diver descends below the surface of the water at a rate of 60 feet each minute. What is the depth of the diver after 10 minutes?</p>
<p>3. STOCK A computer stock lost 2 points each hour for 6 hours. Find the total points the stock fell.</p>	<p>4. DROUGHT A drought can cause the level of the local water supply to drop by a few inches each week. Suppose the level of the water supply drops 2 inches each week. How far will it have dropped in 4 weeks?</p>
<p>5. MONEY Mrs. Rockwell lost money on an investment at a rate of \$4 per day. How much did she lose after two weeks?</p>	<p>6. TENNIS BALLS Josh purchased 8 cans of tennis balls. The cans came with 3 balls in each can. How many balls did Josh purchase?</p>

3-7**Practice: Word Problems*****Dividing Integers*****Divide.**

<p>1. STOCK MARKET During a 5-day workweek, the stock market decreased by 65 points. Find the average daily change in the market for the week.</p>	<p>2. MOTION Mr. Diaz decreased the speed of his car by 30 miles per hour over a period of 10 seconds. Find the average change in speed each second.</p>
<p>3. WEATHER Over the past seven days, Mrs. Cho found that the temperature outside had dropped a total of 35 degrees. Find the average drop in temperature each day.</p>	<p>4. BASKETBALL The basketball team lost their last 6 games. They lost by a total of 48 points. Find the average number of points by which each game was lost.</p>
<p>5. POPULATION The enrollment at Davis Middle School dropped by 60 students over a 5-year period. What is the average yearly drop in enrollment?</p>	<p>6. SUBMARINE A submarine descends at a rate of 60 feet each minute. How long will it take it to descend to a depth of 660 feet below the surface?</p>

4-1**Practice: Word Problems****Writing Expressions and Equations**

OLYMPICS For Exercises 1–4, use the table that shows the number of medals won by each country in the 2002 Winter Olympics.

2002 Winter Olympic Medals					
Country	Medals	Country	Medals	Country	Medals
Germany	35	Austria	16	China	8
USA	34	Italy	12	Finland	7
Norway	24	France	11	Sweden	6
Canada	17	Switzerland	11	Croatia	4
Russia	16	Netherlands	8	South Korea	4

Let x represent the number of medals won by Italy.

1. Write an expression using x to represent the number of medals won by Russia.	2. Write an expression using x to represent the number of medals won by Croatia.
3. Which country's number of medals can be represented by $2x$?	4. Which country's number of medals can be represented by $2x + 10$?
5. GEOGRAPHY The Virgin Islands were acquired by the United States in 1927. This is 29 years after Puerto Rico was acquired. Write an equation to model this situation.	6. POPULATION According to the Census Bureau, the U.S. population grew from 281.4 million in April 2000 to 284.8 million in July 2001. Write an equation to model this situation.

4-2**Practice: Word Problems****Solving Addition and Subtraction Equations**

ANIMALS For Exercises 1–4, use the table.

The average lifespans of several different types of animals are shown in the table.

Average Lifespans of Animals			
Animal	Lifespan (yr)	Animal	Lifespan (yr)
Black Bear	18	Guinea Pig	4
Dog	12	Puma	?
Giraffe	10	Tiger	16
Gray Squirrel	10	Zebra	?

<p>1. The lifespan of a black bear is 3 years longer than the lifespan of a zebra. Write an addition equation that you could use to find the lifespan of a zebra.</p>	<p>2. Solve the equation you wrote in Exercise 1. What is the lifespan of a zebra?</p>
<p>3. The lifespan of a guinea pig is 8 years shorter than the lifespan of a puma. Write a subtraction equation that you could use to find the lifespan of a puma.</p>	<p>4. Solve the equation you wrote in Exercise 3. What is the lifespan of a puma?</p>
<p>5. TECHNOLOGY A survey of teens showed that teens in Pittsburgh aged 12-17 spend 15.8 hours per week online. Teens in Miami/Ft. Lauderdale spend 14.2 hours per week online. Write and solve an addition equation to find the difference in time spent online by teens in these cities.</p>	<p>6. SPORTS Annika Sorenstam won the 2002 LPGA Takefuji Classic with a final score of 14 under par, or -14. Her scores for the first two of the three rounds were -6 and -4. What was Ms. Sorenstam's score for the third round?</p>

4-3**Practice: Word Problems*****Solving Multiplication Equations***

<p>1. TRAVEL The speed limit on an Arizona highway is 75 miles per hour. Suppose a truck traveling at the speed limit drives 225 miles before the driver stops for a break. Write a multiplication equation to find the length of time the truck has traveled.</p>	<p>2. TRAVEL Solve the equation you wrote in Exercise 1. How long did the truck travel?</p>
<p>3. FLOWERS A gardening expert recommends that flower bulbs be planted to a depth of three times their height. Suppose Jenna determines that a certain bulb should be planted at a depth of 4.5 inches. Write a multiplication equation to find the height of the bulb.</p>	<p>4. FLOWERS Solve the equation you wrote in Exercise 3. What is the height of the bulb?</p>
<p>5. EXERCISE A 125-pound person uses 4.4 Calories per minute when walking. Write a multiplication equation to find the number of minutes of walking it will take for a 125-pound person to use 198 Calories.</p>	<p>6. EXERCISE Solve the equation you wrote in Exercise 5. How many minutes of walking it will take for a 125-pound person to use 198 Calories?</p>
<p>7. ELECTRICITY The electric company charges \$0.06 per kilowatt hour of electricity used. Write a multiplication equation to find the number of kilowatt hours of electricity for which the Estevez family was charged if their electric bill was \$45.84.</p>	<p>8. ELECTRICITY Solve the equation you wrote in Exercise 7. For how many kilowatt hours of electricity was the Estevez family charged?</p>

4-4**Practice: Word Problems*****Solving Two-Step Equations***

<p>1. GOLF It costs \$12 to attend a golf clinic with a local pro. Buckets of balls for practice during the clinic cost \$3 each. How many buckets can you buy at the clinic if you have \$30 to spend?</p>	<p>2. MONEY Paulo has \$145 in his savings account. He earns \$36 a week mowing lawns. If Paulo saves all of his earnings, after how many weeks will he have \$433 saved?</p>
<p>3. RETAIL An online retailer charges \$6.99 plus \$0.55 per pound to ship electronics purchases. How many pounds is a DVD player for which the shipping charge is \$11.94?</p>	<p>4. MONEY Caitlin has a \$10 gift certificate to the music store. She has chosen a number of CDs from the \$7 bargain bin. If the cost of the CDs is \$32 after the gift certificate is credited, how many CDs did Caitlin buy?</p>
<p>5. EMPLOYMENT Mrs. Jackson earned a \$500 bonus for signing a one-year contract to work as a nurse. Her salary is \$22 per hour. If her first week's check including the bonus is \$1,204, how many hours did Mrs. Jackson work?</p>	<p>6. PHOTOGRAPHY Morgan subscribes to a website for processing her digital pictures. The subscription is \$5.95 per month and 4 by 6 inch prints are \$0.19 each. How many prints did Morgan purchase if the charge for January was \$15.83?</p>

4-5**Practice: Word Problems*****Inequalities***

<p>1. HURRICANES The National Hurricane Center issues a hurricane warning if sustained winds of 74 miles per hour or higher associated with a hurricane are expected in a coastal area. Write an inequality showing the wind speeds for which a hurricane warning is issued.</p>	<p>2. BUSINESS An Internet company reported that its earnings will be less than the 24 cents per share that was predicted. Write an inequality showing the possible earnings per share.</p>
<p>3. EXERCISE Jumping rope can burn 600 Calories per hour. Write and solve an inequality to find the number of hours of jumping rope that it would take for you to burn at least 450 Calories.</p>	<p>4. TRAVEL The speed limit on highways in Florida is 70 miles per hour. Write and solve an inequality to find how long will it take you to travel the 105 miles from Orlando to St. Augustine if you travel at or below the speed limit.</p>
<p>5. SHOPPING Suppose a DVD costs \$19 and a CD costs \$14. Write an inequality to find how many CDs you can buy along with one DVD if you have \$65 to spend. Solve the inequality.</p>	<p>6. TRAVEL Jeanine has driven 35 miles of a 230-mile trip. If she is traveling at or below the 65-mile-per-hour speed limit, much longer can Jeanine expect to spend completing the trip?</p>

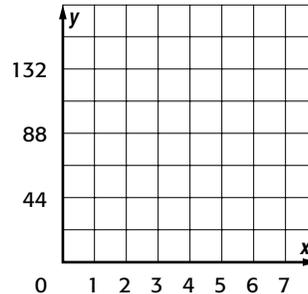
4-6

Practice: Word Problems

Functions and Linear Equations

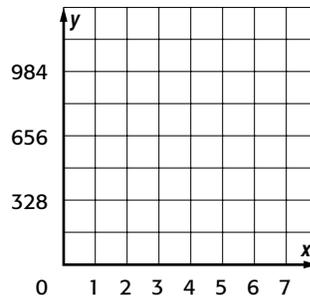
1. TECHNOLOGY The fee for your pager service is \$22 per month. Make a function table that shows your total charge for 1, 2, 3, and 4 months of service.

2. TECHNOLOGY Use the information in Exercise 1 to write an equation in which x represents the number of months and y represents the total charge. Then graph the equation.



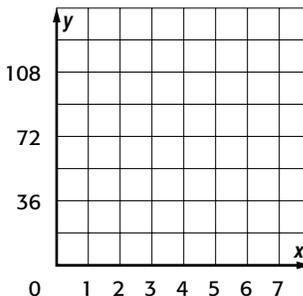
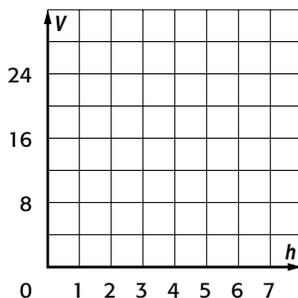
3. TRAINS Between Hiroshima and Kokura, Japan, the bullet train averages a speed of 164 miles per hour, which is the fastest scheduled train service in the world. Make a function table that shows the distance traveled at that speed in 1, 2, 3, and 4 hours.

4. TRAINS Use the information in Exercise 3 to write an equation in which x represents the number of hours and y represents the distance. Then graph the equation.



5. GEOMETRY The formula for the volume of a rectangular prism whose base has an area of 8 square units is $V = 8h$, where V is the volume and h is the height. Graph the function.

6. ANIMALS The fastest insect in the world is the dragonfly with a top speed of 36 miles per hour. Write an equation using x to represent hours and y to represent distance. Then graph the equation.



4-7

Practice: Word Problems

Lines and Slope

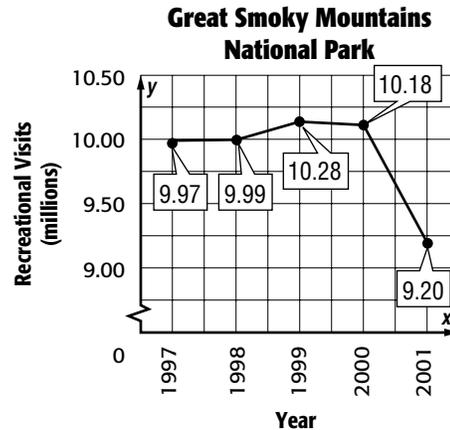
1. TRAVEL Suppose each of these functions was graphed on a coordinate plane. Which line is steeper? Explain.

Hours Traveled	Distance (mi)	
	Scott	Amparo
1	55	60
2	110	120
3	165	180
4	220	240

2. TRAVEL Use the data in Exercise 1. Find the slope of each line.

3. TRAVEL What does the slope of each line that you found in Exercise 2 represent?

4. NATIONAL PARKS Which section of the graph shows the least increase in recreational visits? Describe the slope of this part of the graph.



5. NATIONAL PARKS Use the graph in Exercise 4. What happened to recreational visits between 1998 and 1999? Describe the slope of this part of the graph.

6. NATIONAL PARKS Use the graph in Exercise 4. What happened to the sales between 2000 and 2001? Describe the slope of this part of the graph.

5-1**Practice: Word Problems*****Prime Factorization***

<p>1. FLAG When the United States had 48 states, the stars were arranged in a 6×8 rectangular arrangement. What other rectangular arrangements of 48 stars are possible?</p>	<p>2. MARCHING BAND A marching band has 72 members. If they are to march with an equal number of people in each row, state all possible numbers of rows and numbers of people in each row.</p>
<p>3. BIOLOGY The human face uses 14 muscles to smile and 43 to frown. Which number is prime and which is composite? Explain.</p>	<p>4. BASEBALL CARDS Jack is arranging his prized baseball cards in a frame. If he has 24 cards, in how many different numbers of rows and columns can he display them if each row has the same number of cards?</p>
<p>5. HISTORY It is estimated that Sophocles, an ancient Greek dramatist, died in 406 B.C. Find the prime factorization of 406.</p>	<p>6. ANATOMY There are 230 joints in the human body. Find the prime factorization of 230.</p>
<p>7. PHOTOS Bill is arranging 108 photos to display on a poster board for a presentation. If he arranges an equal number of photos in each row, in how many different numbers of rows and columns can he arrange the photos?</p>	<p>8. ART The supreme example of Renaissance genius, Leonardo da Vinci, passed away in 1519 A.D. Is 1519 a composite or prime number? Explain.</p>

5-2**Practice: Word Problems*****Greatest Common Factor***

<p>1. TABLE TENNIS Rebecca has 20 table tennis balls and 16 table tennis paddles. She wants to sell packages of balls and paddles bundled together. What is the greatest number of packages she can sell with no leftover balls or paddles?</p>	<p>2. TUMBLING Mr. Nicolet wants to organize equal-sized groups of boys and girls for tumbling exercises. If there are 12 boys and 18 girls and each group is all boys or all girls, what is the largest size group he can organize?</p>
<p>3. BAKE SALE Volunteers at a bake sale want to sell slices of banana nut bread and raisin bread packaged together. They have 63 slices of banana nut bread and 45 slices of raisin bread, and they plan to use all the bread. What is the greatest number of packages they can put together? How many slices of each type of bread are in a package?</p>	<p>4. DOG TREATS Krista wants to give her dog a special treat. She has 81 dog bones and 54 pieces of beef jerky. If she wants to give her dog the same number of treats every day, what is the greatest number of days she can feed the dog these treats? How many of each type should she give the dog?</p>
<p>5. FRUIT TREES Mr. Farber has 84 pear trees and 180 apple trees. He wants to plant the trees in rows of equal width. Find the most trees that can be planted in a row if each row has only one type of tree.</p>	<p>6. BOARDS A scouting troop has three boards of lengths 14 feet, 28 feet, and 21 feet. If the boards must be cut to produce equal-sized pieces, what is the longest piece that can be cut with no waste?</p>

5-3**Practice: Word Problems*****Simplifying Fractions***

<p>1. EXAM Mr. Bonilla gave an exam and 20 out of 25 students passed the exam. What fraction of the students passed the exam? Write the answer in simplest form.</p>	<p>2. GASOLINE Aisha filled her car's 24-gallon gas tank. She took a short trip and used 8 gallons of gas. What fraction of the full gas tank was used on the trip? Write the answer in simplest form.</p>
<p>3. BICYCLES A local community college has 860 students. Of these 860 students, 220 ride bicycles. Write the number of bike riders as a fraction of the number of students at the college in simplest form.</p>	<p>4. PRESIDENTS Of the first 22 presidents, 8 were from New York. Write the number of presidents from New York as a fraction of the first 22 presidents in simplest form.</p>
<p>5. TIME Ten hours is what part of a day? Write the fraction in simplest form.</p>	<p>6. MEASUREMENT Eighteen inches is what part of a yard? Write the fraction in simplest form.</p>

5-4**Practice: Word Problems*****Fractions and Decimals***

1. BOYS AND GIRLS There were 6 girls and 18 boys in Mrs. Johnson's math class. Write the number of girls as a fraction of the number of boys. Then write the fraction as a repeating decimal.

2. CATS In a neighborhood of 72 families, 18 families own one or more cats. Write the number of families who own one or more cats as a fraction. Then write the fraction as a decimal.

3. CELLULAR PHONES In Italy, about 74 of every 100 people use cellular telephones. Write the fraction of cellular phone users in Italy. Then write the fraction as a decimal.

4. FRUITS Ms. Rockwell surveyed her class and found that 12 out of the 30 students chose peaches as their favorite fruit. Write the number of students who chose peaches as a fraction in simplest form. Then write the fraction as a decimal.

5. TRAVEL Tora took a short trip of 320 miles. He stopped to have lunch after he had driven 120 miles. Write the fraction of the trip he had completed by lunch in simplest form. Then write the fraction as a decimal.

6. VOTING In a recent school election, 208 of the 325 freshmen voted in their class election. Write the fraction of freshmen who voted. Then write the fraction as a decimal.

5-5**Practice: Word Problems*****Fractions and Percents***

<p>1. LUNCHES Three out of every 10 students in Mr. Chan's class bring their lunch to school. Write this ratio as a percent.</p>	<p>2. COMPUTERS In 2000, 57 out of every 100 school age children (ages 6 to 17 years) had access to a computer both at home and at school. Write this ratio as a percent.</p>
<p>3. SALES TAX In one town, the sales tax is 8%. Write this percent as a fraction in simplest form.</p>	<p>4. HYGEINE Ms. Agosto surveyed her class and found that 15 out of 30 students brushed their teeth more than twice a day. What percent of students brushed more than twice a day?</p>
<p>5. DISCOUNT A local retail store was having a sale and offered all their merchandise at a 25% discount. Write this percent as a fraction in simplest form.</p>	<p>6. SPACE FLIGHT About 64% of all individuals who have flown in space from 1961 to 2001 are from the United States. Write this percent as a fraction in simplest form.</p>

5-6**Practice: Word Problems*****Percents and Decimals***

<p>1. AREA New Mexico's land area is about 0.03 of the total area of the United States. What percent is New Mexico's land area of the total area of the United States?</p>	<p>2. SCALE MODEL A scale model of a building is 0.25 the actual size. What percent of the actual size of the building is the model?</p>
<p>3. NFL COACHES Don Shula ranks among the most successful coaches in the National Football League. In his career, he won 0.665 of his games. Write the decimal as a percent.</p>	<p>4. SOFTBALL Jenny's batting average is 0.346. Write the decimal as a percent.</p>
<p>5. VITAMINS A multiple vitamin contains 450 milligrams of calcium. This is 45% of the recommended daily allowance. Write the percent as a decimal.</p>	<p>6. BASKETBALL Tao makes 74% of his free throws. Write the percent as a decimal.</p>
<p>7. SALES TAX The sales tax in a town is 7.25%. Write the percent as a decimal.</p>	<p>8. FIELD TRIP In Ms. Silver's English class, $20\frac{1}{4}\%$ of the students signed up to visit a local museum. Write the percent as a decimal.</p>

5-7**Practice: Word Problems*****Least Common Multiple***

<p>1. PROMOTION In a promotion for a local delicatessen, every eighth customer will get a free sandwich and every sixth customer will get a free drink. Which customer will be first to get both a free sandwich and a free drink?</p>	<p>2. WORK Alano and Abey both work at night. Alano has every fourth night off and Abey has every sixth night off. If they are both off tonight, how long will it be before they are both off again?</p>
<p>3. RADIO A radio station is giving away a discount coupon to every twelfth caller and a free concert ticket to every twentieth caller. Which caller will be first to win both the coupon and the ticket?</p>	<p>4. MUSIC Faith spent the same amount of money on cassette tapes as she did on CDs. If tapes cost \$12 and CDs cost \$16, what is the least amount of money she could have spent on each?</p>
<p>5. BIKES Three bike riders ride around a circular path. The first rider circles the path in 12 minutes, the second in 18 minutes, and the third in 24 minutes. If they all start at the same place, at the same time, and go in the same direction, after how many minutes will they meet at the starting point?</p>	<p>6. PAPER GOODS At a party store, paper cups come in packages of 15, paper plates come in packages of 30, and napkins come in packages of 20. In order to have the same number of cups, plates, and napkins, what is the least number of each that must be purchased?</p>

5-8**Practice: Word Problems****Comparing and Ordering Rational Numbers**

<p>1. RAIN The amount of rainfall was measured after a recent storm. The north side of town received $\frac{7}{8}$ inch of rain, and the south side received $\frac{13}{15}$ inch of rain. Which side of town received more rain from the storm?</p>	<p>2. MOVIES Because he sees movies at his local theater so often, Delmar is being offered a discount. He can have either $\frac{1}{3}$ off his next ticket or 30% off his next ticket. Which discount should Delmar choose? Explain.</p>
<p>3. TRACK Willie runs the 110-meter hurdles in $17\frac{3}{5}$ seconds, and Anier runs it in $17\frac{6}{11}$ seconds. Which runner is faster?</p>	<p>4. FARMING Cassie successfully harvested $\frac{7}{12}$ of her crop, and Robert successfully harvested 58% of his crop. Which person successfully harvested the larger portion of his or her crop?</p>
<p>5. TRANSPORTATION My-Lien has enough room in her truck to move 3.385 tons of gravel. Her father has asked her to move $3\frac{5}{16}$ tons. Will My-Lien be able to move all of the gravel in only one trip? Explain.</p>	<p>6. WOOD WORKING Kishi has a bolt that is $\frac{5}{8}$ inch wide, and she drilled a hole 0.6 inch wide. Is the hole large enough to fit the bolt? Explain.</p>
<p>7. PIZZA In a recent pizza-eating contest, Alfonso ate $1\frac{3}{8}$ pizzas, Della ate $1\frac{3}{10}$ pizzas, and Delsin ate $1\frac{4}{9}$ pizzas. Which person won the contest?</p>	<p>8. STUDYING For a recent algebra exam, Pat studied $1\frac{8}{15}$ hours, Toni studied $1\frac{11}{20}$ hours, and Morgan studied $1\frac{9}{16}$ hours. List the students in order by who studied the most.</p>

6-1**Practice: Word Problems*****Estimating with Fractions***

COOKING For Exercises 1–4, use the recipe shown below.

Lightning Creamed Potatoes
$\frac{1}{3}$ cup water
$1\frac{1}{2}$ teaspoon salt
$3\frac{3}{4}$ cups pared potatoes, cut in bite-size pieces
$\frac{1}{3}$ cup finely chopped onion
$\frac{1}{2}$ cup light cream

serves 6

<p>1. Daniel wants to serve twelve people the Lightning Creamed Potatoes. Estimate how much salt he will need if he doubles the recipe.</p>	<p>2. Rosita wants to triple the recipe above. Estimate how many cups of pared potatoes she will need.</p>
<p>3. Alvin is going to serve six people. He only has $1\frac{1}{4}$ cups of pared potatoes. About how many cups of potatoes will he have to borrow?</p>	<p>4. Katrina wants to make half of the recipe. About how many cups of potatoes will she need?</p>
<p>5. CARPENTRY A board is $17\frac{3}{4}$ inches long. Carmen wants to shorten the length by about $1\frac{7}{8}$ inches. Estimate the length of the board after the board has been shortened.</p>	<p>6. TRACK Akira ran two miles. He ran the first mile in $7\frac{3}{4}$ minutes and the second mile in $8\frac{3}{4}$ minutes. Estimate how long it took Akira to run two miles.</p>

6-2**Practice: Word Problems*****Adding and Subtracting Fractions***

RETAIL STORES For Exercises 1–4 use the table below. It shows what fraction of the stores at a mall fall into seven categories.

Type of Store	Fraction of Stores in Mall
jewelry	$\frac{1}{30}$
clothing	$\frac{8}{15}$
gifts	$\frac{3}{20}$
electronics	$\frac{1}{20}$
department	$\frac{1}{15}$
shoes	$\frac{1}{15}$
athletic	$\frac{1}{10}$

1. What fraction of the stores are jewelry or gift stores?	2. What fraction of the stores are clothing or electronics stores?
3. Which type of store has the greatest number of stores?	4. How many more clothing stores are there than athletic stores? Write as a fraction.
5. SEWING Jin wants to make a scarf and matching hat for his sister. The patterns call for $\frac{7}{8}$ yard of fabric for the scarf and $\frac{1}{2}$ yard of fabric for the hat. How much fabric should Jin buy?	6. RESTAURANT Ms. Malle owns a restaurant. Typically, $\frac{1}{5}$ of the customers order fish, while $\frac{1}{4}$ of the customers order poultry. What fraction of her customers order either fish or poultry?

6-3**Practice: Word Problems*****Adding and Subtracting Mixed Numbers***

HEIGHT For Exercises 1–6, use the table below. It shows the heights of five students. Write all answers in simplest form.

Student	Height (ft)
Karen	$5\frac{1}{6}$
Arturo	6
Felisa	$4\frac{11}{12}$
Max	$5\frac{3}{4}$
Silvia	$5\frac{1}{4}$

1. How much taller is Max than Felisa?	2. How much shorter is Karen than Arturo?
3. If Silvia stood on a box that was $1\frac{5}{6}$ feet high, how far would the top of her head be from the floor?	4. What is the sum of Felisa and Silvia's heights?
5. The distance from the floor to Karen's knee is $1\frac{1}{4}$ feet. What is the distance from her knee to the top of her head?	6. Max grew $\frac{1}{3}$ foot last year. How tall was he last year?

6-4**Practice: Word Problems*****Multiplying Fractions and Mixed Numbers***

<p>1. POPULATION If $\frac{4}{5}$ of the population of a certain town is considered to be middle class and the population of the town is 2,000, how many people are considered middle class?</p>	<p>2. READING Robin has read $\frac{3}{4}$ of a book. Mark said he had read $\frac{1}{2}$ as much as Robin. What fraction of the book has Mark read?</p>
<p>3. RADIO A radio station spends $\frac{1}{40}$ of each 24 hours on public service announcements. How much time is spent on public service announcements each day?</p>	<p>4. SALE A bicycle is on sale for $\frac{2}{3}$ of its original price. If the original price is \$354, what is the sale price?</p>
<p>5. STUDENT POPULATION One sixth of the students at a local college are seniors. The number of freshmen students is $2\frac{1}{2}$ times that amount. What fraction of the students are freshmen?</p>	<p>6. SEWING Anna wants to make 4 sets of curtains. Each set requires $5\frac{1}{8}$ yards of fabric. How much fabric does she need?</p>
<p>7. RUNNING It takes Awan $8\frac{1}{3}$ minutes to run one mile. It takes Kate $1\frac{1}{5}$ times longer. How long does it take Kate to run one mile?</p>	<p>8. STOCK Carl bought some stock at \$25 a share. The stock increased to $1\frac{1}{2}$ times its value. How much is the stock per share?</p>

6-5**Practice: Word Problems****Algebra: Solving Equations**

<p>1. BIKING The speed s that Brandon can ride his bike if he rides $\frac{3}{5}$ of an hour and travels 4 miles is given by the equation $4 = \frac{3}{5}s$. What is Brandon's speed?</p>	<p>2. BAND The woodwind section of the middle school band makes up $\frac{1}{4}$ of the band. There are 9 members in the woodwind section. Use the equation $\frac{1}{4}m = 9$ to find the number of members m in the band.</p>
<p>3. SALE A coat is selling for $\frac{3}{4}$ of the original price. The sale price is \$180. The original price p can be found using the equation $\frac{3}{4}p = 180$. Find the original price.</p>	<p>4. SALARIES Aaron's annual salary is $\frac{2}{3}$ as much as Juanita's salary. Aaron makes \$46,000. Find Juanita's salary x using the equation $46,000 = \frac{2}{3}x$.</p>
<p>5. ENDANGERED SPECIES In the U. S., there are $\frac{14}{29}$ as many endangered species of birds as of reptiles. The number of endangered species of birds b can be compared to the 14 endangered species of reptiles using $\frac{14}{29}b = 14$. Find the number of endangered species of birds.</p>	<p>6. SALES TAX The sticker price p of a purchase with $\frac{1}{10}$ sales tax and a total price (including tax) of \$5.28 can be found using the equation $\frac{11}{10}p = 5.28$. What is the sticker price?</p>
<p>7. SEWING Each costume uses $\frac{3}{4}$ yard of fabric. The number of costumes c that can be made using $11\frac{1}{4}$ yards of fabric can be found using the equation $\frac{3}{4}c = 11\frac{1}{4}$. Find the number of costumes that can be made.</p>	<p>8. SAVINGS Jasmine saves \$46 each month from her part-time job. She saves $\frac{2}{5}$ of her earnings. Her earnings a can be found by using the equation $\frac{2}{5}a = 46$. Find her earnings.</p>

6-6**Practice: Word Problems*****Dividing Fractions and Mixed Numbers***

<p>1. PUPPETS If a puppet requires $\frac{3}{4}$ yards of material, how many puppets can be made from 9 yards of material?</p>	<p>2. COOKING A batch of cookies requires $1\frac{1}{2}$ cups of sugar. How many batches can Ty make with $7\frac{1}{2}$ cups of sugar?</p>
<p>3. FOOD Julia has $3\frac{1}{2}$ pounds of dog food. She plans to split it equally among her 7 dogs. How much will dog food will each dog receive?</p>	<p>4. SNOW CONES Roger has a 28-pound block of ice for his snow cone stand. If each snow cone requires $\frac{2}{3}$ pound of ice, how many snow cones can Roger make?</p>
<p>5. APPLES Juan took 6 apples and cut each into one-eighths. How many pieces of apple did he have?</p>	<p>6. VACATION The Torres family drove 1,375 miles during their $6\frac{1}{4}$-day vacation. Find the average number of miles they traveled each day.</p>
<p>7. RUNNING Hugo just joined the cross-country team and can run at a rate of $\frac{1}{7}$ mile each minute. How long will it take him to run a 5-mile race?</p>	<p>8. LUMBER Mrs. Shin has a piece of lumber that is $11\frac{5}{8}$ inches wide. She plans to split the width of lumber into 3 equal pieces. How wide will each piece be?</p>

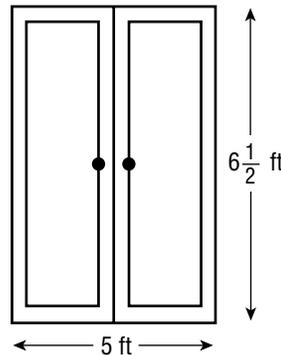
6-7**Practice: Word Problems****Measurement: Changing Customary Units**

<p>1. WEIGHT The average weight of a baby at birth is 7 pounds. How many ounces is this?</p>	<p>2. WATERFALLS The height of Niagara Falls is 182 feet. How many yards high is it?</p>
<p>3. GASOLINE The gasoline tank of a minivan holds 18 gallons. How many quarts is this?</p>	<p>4. TELEPHONES Portable telephones can weigh as little as 8 ounces. How many pounds is this?</p>
<p>5. RECIPE A recipe for ice cream calls for 56 fluid ounces of milk. How many cups of milk is this?</p>	<p>6. STATUE The Statue of Liberty weighs 450,000 pounds. How many tons is this?</p>
<p>7. TUNNEL The Ted Williams Tunnel under Boston Harbor is 8,448 feet long. How many yards is this?</p>	<p>8. COAL The United States exports over 200 billion pounds of coal. How many tons is this?</p>

6-8**Practice: Word Problems****Geometry: Perimeter and Area**

1. PYRAMID The Great Pyramid in Egypt has a square base with sides 230 meters long. Find the perimeter and area of the base of the Great Pyramid.

2. WINDOWS Mrs. Johnson was planning to caulk around the frame of her patio doors that measure 5 feet by $6\frac{1}{2}$ feet. In order to help her to know how much caulk to buy, find the perimeter of the doors.



3. PENTAGON The Pentagon is a five-sided building that houses the U.S. Department of Defense in Arlington, Virginia. If each side of the Pentagon measures 921 feet, what is the walking distance around its exterior?

4. FENCING Mr. Lao is planning to build a rectangular cattle pen that measures 50 feet by 75 feet. Find the total length of fencing that he will need to purchase.

5. CARPET Mr. Yuji plans on buying carpet for his bedroom that measures 12 feet by 12 feet. So he will know how much carpet to buy, find the area of his bedroom.

6. BORDER Mrs. Jackson is going to put up a wallpaper border along the top of the walls in her dining room. If the dining room measures 16 meters by 12 meters, how much border should she buy?

7. LOBBY A hotel lobby measures 40 yards by 60 yards. Find the area and perimeter of the lobby's floor.

8. MURAL An artist painted a mural measuring 9 feet by $20\frac{1}{2}$ feet. Find the area and perimeter of the mural.

6-9**Practice: Word Problems****Geometry: Circles and Circumference**

<p>1. PLATES A manufacturing company is producing dinner plates with a diameter of 12 inches. They plan to put a gold edge on each plate. Determine how much gold edging they need for each plate by finding the circumference of each plate. Round to the nearest tenth.</p>	<p>2. MONEY A dime has a radius of $8\frac{1}{2}$ millimeters. Find the circumference of a dime to the nearest tenth.</p>
<p>3. MERRY-GO-ROUND Mr. Osterhout is putting trim around the edge of a circular merry-go-round that has a diameter of 15 feet. How much trim does he need to buy to the nearest tenth?</p>	<p>4. PIZZA Find the circumference of a pizza with a diameter of 10 inches. Round to the nearest tenth.</p>
<p>5. RACING A circular racetrack has a diameter of $\frac{1}{2}$ mile. How far does a car travel in one lap around the track? Round to the nearest tenth.</p>	<p>6. TIRE A bicycle tire has a radius of 15 inches. What is the circumference of the tire? Round to the nearest tenth.</p>
<p>7. EQUATOR Earth's diameter at the equator is 7,926 miles. Find the distance around Earth at its equator to the nearest tenth.</p>	<p>8. SATURN The ring system around Saturn has a diameter of 170,000 miles. Find the circumference of the ring system.</p>

7-1**Practice: Word Problems****Ratios**

<p>1. ELECTIONS In an election for sheriff, 210 people voted. If there were 1,260 possible voters, write a ratio to compare the number of people who voted to the number of possible voters.</p>	<p>2. DENTAL CARE Taru surveyed 60 dentists and found that 48 favored the use of fluoride toothpaste. Write a ratio to compare the number of dentists favoring the use of a fluoride toothpaste to all dentists surveyed.</p>
<p>3. E-MAIL One morning, Mirna counted 15 junk E-mails out of 21 E-mails in her inbox. Write a ratio comparing the number of junk E-mails to the total number of E-mails.</p>	<p>4. SURFING One evening at his local surf spot, Jeff counted 28 surfers in the water. Among those, he counted 21 that had hoods on their wetsuits. Write a ratio comparing the number of surfers with hoods to the total number of surfers.</p>
<p>5. MUSIC A music company signed 12 new artists to its label in 2002. Out of the 12, 10 artists have hit songs. Write a ratio to compare the number of artists with hit songs to the total number of artists signed in 2002.</p>	<p>6. COOKING Charlene poured 18 fluid ounces of juice into a 1-quart pitcher. Write a ratio comparing the amount of juice in the pitcher to the total capacity of the pitcher.</p>
<p>7. BASEBALL In baseball, David has 10 hits out of 14 at bats. Adam has 15 hits out of 21 at bats. For each player, write a ratio that represents his total number of hits out of times at bat. Are these ratios equivalent?</p>	<p>8. DRIVING Sarah can drive 198 miles on 11 gallons of gasoline. On 6 gallons of gasoline, Rachel can travel 138 miles. Write a ratio that compares miles traveled per gallon of gasoline for each car. Do the cars get the same mileage?</p>

7-2**Practice: Word Problems****Rates**

<p>1. TRAVEL During Sonia's trip across the country, she traveled 2,884 miles. Her trip took 7 days. Find a unit rate to represent the average miles she traveled per day during the trip.</p>	<p>2. BUDGET Steve was offered \$5,025 per year for a weekend lifeguarding job at a local pool. He wants to know how much his monthly income will be at this salary level. What is his rate of pay in dollars per month?</p>
<p>3. MUSIC Randall recorded 8 songs on his most recent CD. The total length of the CD is 49 minutes. Find a unit rate to represent the average length per song on the CD.</p>	<p>4. CARPETING Hana paid \$1,200 for the carpet in her living room. The room has an area of 251.2 square feet. What was her unit cost of carpeting in dollars per square foot? Round to the nearest cent.</p>
<p>5. SHOPPING An 8-ounce can of tomatoes costs \$1.14. A 12-ounce can costs \$1.75. Which can of tomatoes has the better unit price?</p>	<p>6. PETS Last month, Hao's dog ate 40 cans of dog food in 31 days. How many cans should Hao buy to feed his dog for the next 6 days?</p>

7-3**Practice: Word Problems*****Solving Proportions***

<p>1. COOKING Theo wants to use a cookie recipe that makes 36 cookies but he wants to reduce the number of cookies to 24. If the recipe specifies using 2 cups of sugar, how much sugar should he use?</p>	<p>2. MEDICINE In order to determine her pulse rate, June's nurse counted 18 beats in her pulse in 15 seconds. At this rate, how many beats would she have in 60 seconds?</p>
<p>3. LABOR Ed earned \$112 for 8 hours of work. At this rate, how much will he earn for 40 hours of work?</p>	<p>4. TRAVEL Rita traveled 1,250 miles in the first 3 days of her trip. At this rate, how long will it take her to travel 1,875 miles?</p>
<p>5. MODELS An architect built a model of a 220-foot tall building he is designing. The model is 25 inches tall and 10 inches wide. How wide is the actual building?</p>	<p>6. TESTING Mary is preparing for her college entrance exams. In a practice test, she answered 12 problems in 30 minutes. At this rate, how many questions can she expect to answer in 150 minutes?</p>

7-4**Practice: Word Problems****Scale Drawings**

<p>1. CARS A scale drawing of an automobile has a scale of 1 inch = $\frac{1}{2}$ foot. The actual width of the car is 8 feet. What is the width on the scale drawing?</p>	<p>2. MODELS A model ship is built to a scale of 1 centimeter:5 meters. The length of the model is 30 centimeters. What is the length of the actual ship?</p>
<p>3. BUILDING Jose wants to build a model of a 180-meter tall building. He will be using a scale of 1.5 centimeters = 3.5 meters. How tall will the model be? Round your answer to the nearest tenth.</p>	<p>4. TRAVEL Susan is driving to Mount Shasta. On her map, she is a distance of $7\frac{3}{4}$ inches away. The scale of the map is $\frac{1}{2}$ inch = 50 miles. How far must Susan travel to reach her destination?</p>
<p>5. MAPS A map of Levi's property is being made with a scale of 2 centimeters: 3 meters. What is the scale factor?</p>	<p>6. LANDSCAPING A pond is being dug according to plans that have a scale of 1 inch = 6.5 feet. The maximum distance across the pond is 9.75 inches on the plans. What will be the actual maximum distance across the pond?</p>

7-5**Practice: Word Problems*****Fractions, Decimals, and Percents***

INTERNET For Exercises 1–4, use the table. It shows the percents of online shopping purchases made by all Internet users and the percents made by Internet users over age 55.

Most Popular Online Purchases		
	Internet Users Over 55	All Internet Users
computer software	43%	19%
books	43%	21%
computer hardware	24%	13%
music CDs	29%	22%
clothing	19%	8%

1. What fraction of Internet users over 55 bought clothing online?	2. What fraction of all Internet users bought clothing online?
3. What fraction of all Internet users bought music CDs online?	4. Is the fraction of Internet users over 55 who bought books online greater or less than $\frac{22}{50}$? Explain.
5. FOOTBALL In 2001 San Francisco quarterback Jeff Garcia completed 316 out of 504 passes. What was his pass completion percentage to the nearest tenth?	6. COMPUTERS In Joan's math class, there are 20 computers and 32 students. What percent of students will be able to use a computer without sharing?
7. VEHICLES In the town of Orick, 5 out of 13 vehicles are trucks. What percent of the vehicles are trucks? Round to the nearest tenth.	8. DENTISTRY Dana has fillings in 4 of her 32 teeth. What percent of her teeth have fillings?

7-6**Practice: Word Problems*****Percents Greater Than 100%
and Percents Less Than 1%***

<p>1. INTERNET Kilroy found that 0.70% of the documents from the Internet had names that ended in “.txt” or “.text”. Write this percent as a decimal and as a fraction.</p>	<p>2. BUSINESS Jocelyn expects her new software company to increase its sales next year $2\frac{3}{8}$ times their present value. Write this increase as a percent.</p>
<p>3. UTILITIES City records showed that 0.8% of new homes had no access to electricity. Write this percent as a decimal and as a fraction in simplest form.</p>	<p>4. PETS Berto got a puppy 8 weeks ago. In this time, the puppy’s weight increased 215%. Write this percent as a decimal and as a fraction.</p>
<p>5. MANUFACTURING The Quality Assurance department at a gear company found that there were 3 defective gears for every 675 produced. Write this as a fraction and as a percent. Round to the nearest hundredth.</p>	<p>6. MEDICINE Estelle’s pharmacist said that the medicine Estelle was taking contained no more than $\frac{1}{500}$ gram of impurities per gram of total weight. Write this fraction as a percent.</p>

7-7

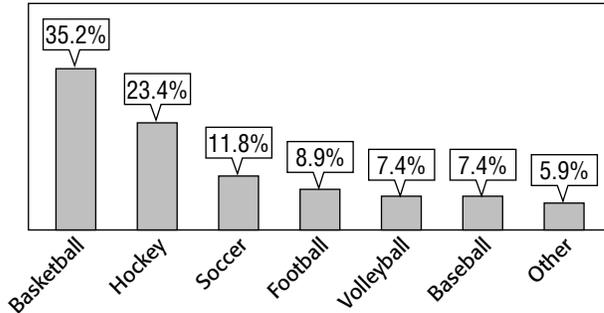
Practice: Word Problems

Percent of a Number

SPORTS For Exercises 1 and 2, use the graph below. It shows the results of a poll of 440 ninth grade students. Round answers to the nearest whole number.

PETS For Exercises 3 and 4, use the table below. It shows the pet ownership in Los Angeles, California. Assume that the same percents apply to a town of 1,650 households. Round answers to the nearest whole number.

Favorite Sports of Students



Pets in Household	Percent
at least one dog or cat	26.7
at least one dog	19.9
at least one cat	13
at least one dog and one cat	6.19

- | | |
|--|--|
| <p>1. Write a proportion that can be used to find how many students surveyed chose hockey as their their favorite sport. Then solve.</p> | <p>2. How many students surveyed chose basketball as their favorite sport?</p> |
| <p>3. Write a proportion that can be used to find how many households have at least one dog. Then solve.</p> | <p>4. How many households have at least one dog or cat?</p> |
| <p>5. VOTING Going into a recent election, only about 62% of people old enough to vote were registered. In a community of about 55,200 eligible voters, how many people are registered?</p> | <p>6. COLLEGE A local college recently reported that enrollment increased to 108% percent of last year. If enrollment last year was at 17,113, about how many students enrolled this year? Round to the nearest whole number.</p> |

7-8**Practice: Word Problems*****The Percent Proportion***

<p>1. DRIVING David installed a device on his car that guaranteed to increase his gas mileage by 15%. He currently gets 22 miles per gallon. How much will the gas mileage increase after installing the device?</p>	<p>2. POPULATION The number of students at Marita's school decreased to 98% of last year's number. Currently, there are 1,170 students. How many students were there last year? Round to the nearest whole number.</p>
<p>3. VOTING Yolanda's club has 35 members. Its rules require that 60% of them must be present for any vote. At least how many members must be present to have a vote?</p>	<p>4. GARBAGE This month, Chun's office produced 690 pounds of garbage. Chun wants to reduce the weight of garbage produced to 85% of the weight produced this month. What is the target weight for the garbage produced next month?</p>
<p>5. SALARIES Alma just received a 6% raise in salary. Before the raise, she was making \$52,000 per year. How much more will Alma earn next year?</p>	<p>6. SPORTS Sally's soccer team played 25 games and won 17 of them. What percent did the team win?</p>

8-1**Practice: Word Problems****Percent and Estimation**

<p>1. ORCHESTRA The orchestra at Millard Middle School has 120 members. Of these, 17% are eighth-grade students. Estimate the number of eighth-grade students in the orchestra.</p>	<p>2. RESTAURANTS In one west coast city, 34% of the restaurants are on the river. The city has 178 restaurants. Estimate the number of restaurants that are on the river.</p>
<p>3. FARMING Rhonda planted green beans on 67% of her farm. Rhonda's farm has 598 acres of land. Estimate the number of acres of green beans on Rhonda's farm.</p>	<p>4. HOTELS At the Eastward Inn hotel, 47% of the rooms face the pool. The hotel has 92 rooms. Estimate the number of rooms that face the pool.</p>
<p>5. TREES The students in Leon's seventh grade science class determined that 42% of the trees at a local park are pine trees. If there are 632 trees in the park, about how many of them are pine trees?</p>	<p>6. BOOKS Jenna has read 0.7% of a book. If the book has 431 pages, estimate the number of pages Jenna has read.</p>
<p>7. FITNESS At the office where Mika works, 40% of the 18 employees exercise at least three times a week. Estimate the number of people who exercise at least three times a week.</p>	<p>8. PETS Of all seventh grade students at Hart Middle School, 0.3% of the students own a pet iguana. If there are 610 seventh grade students at Hart, about how many own pet iguanas?</p>

8-2**Practice: Word Problems*****The Percent Equation***

<p>1. DINING Jonas and Linda's restaurant bill comes to \$23.40. They are planning to tip the waiter 15% of their bill. How much money should they leave for a tip?</p>	<p>2. CHESS The Briarwood Middle School chess club has 55 members. 22 of the members are in seventh grade. What percent of the members of the chess club are in seventh grade?</p>
<p>3. TENNIS In the city of Springfield, 75% of the parks have tennis courts. If 15 parks have tennis courts, how many parks does Springfield have altogether?</p>	<p>4. COLLEGE There are 225 students in eighth grade at Jefferson Middle School. A survey shows that 64% of them are planning to attend college. How many Jefferson eighth grade students are planning to attend college?</p>
<p>5. BASEBALL In the 2001 season, the Chicago Cubs won 88 out of 162 games. What percent of games did the Cubs win? Round to the nearest tenth if necessary.</p>	<p>6. HOUSING In the Stoneridge apartment complex, 35% of the apartments have one bedroom. If there are 49 one-bedroom apartments, what is the total number of apartments at Stoneridge?</p>
<p>7. SPACE On Mars, an object weighs 38% as much as on Earth. How much would a person who weighs 165 pounds on Earth weigh on Mars?</p>	<p>8. FOOTBALL In the 2001 season, quarterback Matt Hasselbeck of the Seattle Seahawks had 8 passes intercepted out of 321 attempts. What percent of Matt Hasselbeck's passes were intercepted? Round to the nearest tenth if necessary.</p>

8-3**Practice: Word Problems*****Using Statistics to Predict***

- 1. SHOES** The table shows the results of a survey in which seventh graders were asked how many pairs of shoes they own. Predict how many of the 632 seventh graders at Seneca West Middle School own more than 7 pairs of shoes.

Shoes	Percent
3 or less	10%
4	20%
5	21%
6	22%
7	19%
more than 7	8%

- 2. ACTIVITIES** Of the students listed as members of a high school academic team, 75% were involved in sports, speech, music or debate. If 111 students were listed as part of the teams, how many were involved in sports, speech, music, or debate?

- 3. MOVIEGOERS** A research study found that about 63% of people 18 or older who go to the movies at least once a month own a personal computer. Out of 500 people 18 and older who go to the movies once or more a month, how many of them would you expect to own a personal computer?

- 4. HAIR** A survey showed that 37% of people 12 to 17 years old use hair gel. Predict how many of the 30 students in Mr. Avalon's ninth grade class use hair gel.

- 5. GRADUATION** A survey of first-year students at North Carolina State University showed that about 73% expect to complete their degree in 4 years. If there are 3,333 first-year students, how many of them expect to complete their degree in 4 years?

- 6. INTERNET** A recent survey conducted by the Millard school district showed that 87% of households of students have Internet access at home. If there are 19,000 Millard households, how many have Internet access?

8-4**Practice: Word Problems*****Percent of Change***

<p>1. SHOES A popular brand of running shoes costs a local store \$68 for each pair. If the store sells the shoes for \$119, what is the percent of increase in the price?</p>	<p>2. CLUBS Last year the backgammon club had 30 members. This year the club has 24 members. Find the percent of decrease in the number of members.</p>
<p>3. READING In the seventh grade, Rachel read 15 books. In the eighth grade, she read 18 books. Find the percent of increase in the number of books Rachel read.</p>	<p>4. VOTES Last year 762 students voted in the student council election at San Bruno Middle School. This year 721 students voted. To the nearest tenth, what was the percent of change in the number of students that voted?</p>
<p>5. HEIGHT When Hugo was 9 years old he was 56 inches tall. Hugo is now 12 years old and he is 62 inches tall. Find the percent of increase in Hugo's height to the nearest tenth.</p>	<p>6. PLANTS Alicia planted 45 tulip bulbs last year. This year she plans to plant 65 bulbs. Find the percent of increase in the number of tulip bulbs to the nearest tenth.</p>
<p>7. PICTURES The 2002 yearbook at Middleton Middle School had 236 candid pictures of students. The 2001 yearbook had 214 candid pictures of students. To the nearest tenth, what was the percent of change in the number of candid student pictures?</p>	<p>8. POPULATION In 1990, there were 4,298,000 Mexican immigrants living in the United States. In 2000 this number had increased to 7,858,000. Find the percent of increase to the nearest tenth.</p>

8-5**Practice: Word Problems*****Sales Tax and Discount***

<p>1. SKATEBOARDS Ines wants to buy a skateboard but she does not know if she has enough money. The price of the skateboard is \$85 and the sales tax is 6%. What will be the total cost of the skateboard?</p>	<p>2. PRETZELS The Spanish club sold hot pretzels as a fund-raiser. The pretzels normally sold for \$1.50, but near the end of the sale they wanted to sell as many as possible, so they reduced the price by 30%. What was the new price for a hot pretzel?</p>
<p>3. COMPUTERS Andrea ordered a computer on the Internet. The computer cost \$1,499 plus $7\frac{1}{2}\%$ sales tax. What was the total amount Andrea paid for her computer?</p>	<p>4. BOOKS Nate went shopping at a bookstore. The price of the book he selected was \$14.95, but it had a sale sticker on it. When he paid for the book, he was charged \$12.71 before sales tax was added. What was the percent of discount to the nearest percent?</p>
<p>5. CELL PHONES Justin is buying a cell phone that has a regular price of \$149. The cell phone is on sale for 15% off the regular price. What will be the sale price?</p>	<p>6. MAGAZINES Ivan bought two magazines for \$4.95 each. If the sales tax was 6.75%, what was the total amount that he paid for the magazines?</p>
<p>7. MOVIES A video store is having a sale in which DVDs are on sale for 20% off. During this sale, what is the cost of three DVDs that regularly cost \$16.99?</p>	<p>8. MODELS The original price of a collectible model airplane is \$115. The discounted price is \$99. What is the percent of discount to the nearest percent?</p>

8-6**Practice: Word Problems*****Simple Interest***

<p>1. SAVINGS ACCOUNT How much interest will Hannah earn in 4 years if she deposits \$630 in a savings account at 6.5% simple interest?</p>	<p>2. INVESTMENTS Terry invested \$2,200 in the stock market for 2 years. If the investment earned 12% simple interest, how much money did Terry earn in interest in 2 years?</p>
<p>3. SAVINGS ACCOUNT Malik deposited \$1,050 in a savings account, and it earned \$241.50 in simple interest after four years. Find the interest rate on Malik's savings account.</p>	<p>4. INHERITANCE Kelli Rae's inheritance from her great-grandmother was \$220,000 after taxes. If Kelli Rae invests this money in a savings account that earns \$18,260 in simple interest every year, what is the interest rate on her account?</p>
<p>5. RETIREMENT Mr. Pham has \$410,000 in a retirement account that earns 3.85% simple interest each year. Find the amount earned each year by this investment.</p>	<p>6. COLLEGE FUND When Melissa was born, her parents put \$8,000 into a college fund account that earned 9% simple interest. Find the total amount in the account after 18 years.</p>
<p>7. LOTTERY Raj won \$900,000 in a regional lottery. After paying \$350,000 in taxes, he invested the remaining money in a savings account at 4.25% simple interest. How much money is in the account if Raj makes no deposits or withdrawals for two years?</p>	<p>8. SAVINGS Mona opened a savings account with a \$500 deposit and a simple interest rate of 5.6%. If there were no deposits or withdrawals, how much money is in the account after $8\frac{1}{2}$ years?</p>

9-1**Practice: Word Problems****Simple Events**

COINS Susan opened her piggy bank and counted the number of each coin. The table at the right shows the results. For Exercises 1–3, assume that the coins are put in a bag and one is chosen at random.

Coin	Number
quarters	15
dimes	21
nickels	22
pennies	32

1. What is the probability that a quarter is chosen?	2. What is the probability that a nickel or a dime is chosen?
3. What is the probability that the chosen coin is worth more than 5 cents?	4. NUMBER CUBES Juan has two number cubes, each with faces numbered 1, 2, ...6. What is the probability that he can roll the cubes so that the sum of the faces showing equals 11?
5. SKATEBOARDS Carlotta bought a new skateboard for which the probability of having a defective wheel is 0.015. What is the probability of not having a defective wheel?	6. CALCULATORS Jake's teacher had 6 calculators for 28 students to use. If the first students to use the calculators are chosen at random, what is the probability that Jake will get one?
7. VEHICLES The rental car company had 14 sedans and 8 minivans available to rent. If the next customer picks a vehicle at random, what is the probability that a minivan is chosen?	8. MUSIC Tina has 16 pop CDs, 6 classical, and 2 rock. Tina chooses a CD at random. What is the probability she does not choose a classical CD?

9-2**Practice: Word Problems*****Tree Diagrams***

1. GASOLINE Craig stops at a gas station to fill his gas tank. He must choose between full-service or self-service and between regular, midgrade, and premium gasoline. Draw a tree diagram showing the possible combinations of service and gasoline type. How many possible combinations are there?

2. COINS Judy tosses a coin 4 times. Draw a tree diagram showing the possible outcomes. What is the probability of getting at least 2 tails?

3. COINS In Exercise 2, what is the probability of getting 2 heads, then 2 tails?

4. EQUIPMENT The computer accessory that Joanne is considering selling at her store comes in white, beige, gray, or black and as an optical mouse, mechanical mouse, or trackball. How many combinations of color and model must she stock in order to have at least one of every possible combination?

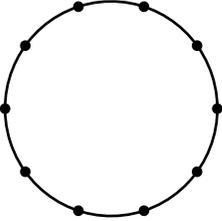
9-3**Practice: Word Problems*****The Fundamental Counting Principle***

<p>1. SURFBOARD Jay owns 3 surfboards and 2 wetsuits. If he takes one surfboard and one wetsuit to the beach, how many different combinations can he choose?</p>	<p>2. SHOPPING John is trying to decide which bag of dog food to buy. The brand he wants comes in 4 flavors and 3 sizes. How many choices are there?</p>
<p>3. LOTTERY To purchase a lottery ticket, you must select 4 numbers from 0 to 9. How many possible lottery tickets can be chosen?</p>	<p>4. RESTAURANTS Miriam's favorite restaurant has 3 specials every day. Each special has 2 choices of vegetable and 3 choices of dessert. How many different meals could Miriam have?</p>
<p>5. ROUTES When Sunil goes to the building where he works, he can go through 4 different doors into the lobby. Then he can go to the seventh floor by taking 2 different elevators or 2 different stairways. How many different ways can Sunil get from outside the building to the seventh floor?</p>	<p>6. STEREOS Jailin went to her local stereo store. Given her budget and the available selection, she can choose between 2 CD players, 5 amplifiers, and 3 pairs of speakers. How many different stereos can Jailin purchase?</p>
<p>7. DESSERT For dessert you can choose apple, cherry, blueberry, or peach pie to eat, and milk or juice to drink. How many different combinations can you choose from?</p>	<p>8. TESTS John is taking a true or false quiz. There are six questions on the quiz. How many ways can the quiz be answered?</p>

9-4**Practice: Word Problems*****Permutations***

<p>1. AREA CODES How many different 3-digit area codes can be created if no digit can be repeated?</p>	<p>2. CARDS Jason is dealt five playing cards. In how many different orders could Jason have been dealt the same hand?</p>
<p>3. PASSWORDS How many different 3-letter passwords are possible if no letter may be repeated?</p>	<p>4. RACING All 22 students in Amy's class are going to run the 100-meter dash. In how many ways can the students finish in first, second, and third place?</p>
<p>5. LETTERS How many ways can you arrange the letters in the word HISTORY?</p>	<p>6. PARKING The parking lot for a company has three parking spaces for compact cars. The company has 8 employees with compact cars. How many ways can the compact parking spaces be filled?</p>
<p>7. SERIAL NUMBERS How many different 6-digit serial numbers are available if no digit can be repeated?</p>	<p>8. WINNERS There are 156 ways for 2 cars to win first and second place in a race. How many cars are in the race?</p>

9-5**Practice: Word Problems****Combinations**

<p>1. SNACKS A vending machine can display six snacks. If there are eight different kinds of snacks available, how many different groups of six different snacks can be displayed?</p>	<p>2. MUSIC Each month, Jose purchases two CDs from a selection of 20 bestselling CDs. How many different pairs of CDs can Jose choose if he chooses two different CDs?</p>
<p>3. TESTS On a math test, you can choose any 20 out of 23 questions. How many different groups of 20 questions can you choose?</p>	<p>4. RESTAURANTS The dinner special at a local pizza parlor gives you the choice of two toppings from a selection of six toppings. How many different choices are possible if two different toppings are chosen?</p>
<p>5. TESTING In a science fair experiment, two units are selected for testing from every 500 units produced. How many ways can these two units be selected?</p>	<p>6. MEETINGS Linda's teacher divided the class into groups of five and required each member of a group to meet with every other member of that group. How many meetings will each group have?</p>
<p>7. BASEBALL A baseball coach has 13 players to fill nine positions. How many different teams could he put together?</p>	<p>8. GEOMETRY Ten points are marked on a circle. How many different triangles can be drawn between any three points?</p> 

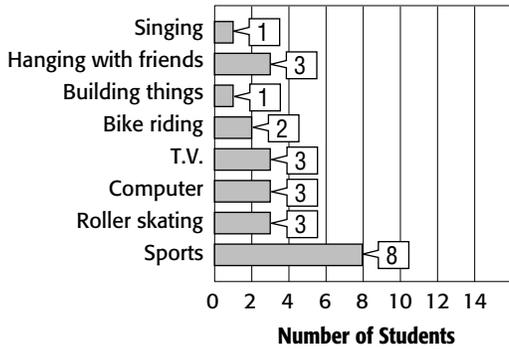
9-6

Practice: Word Problems

Theoretical and Experimental Probability

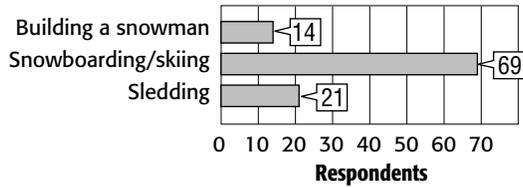
HOBBIES For Exercises 1–3, use the graph of a survey of 24 seventh grade students asked to name their favorite hobby.

What is your favorite hobby?



TELEVISION For Exercises 5 and 6, use the graph of a survey with 104 responses in which respondents were asked about their favorite winter activities.

What is your favorite winter activity?



<p>1. What is the probability that a student's favorite hobby is roller skating?</p>	<p>2. Suppose 200 seventh grade students were surveyed. How many can be expected to say that roller skating is their favorite hobby?</p>
<p>3. Suppose 60 seventh grade students were surveyed. How many can be expected to say that bike riding is their favorite hobby?</p>	<p>4. MARBLES A bag contains 5 blue, 4 red, 9 white, and 6 green marbles. If a marble is drawn at random and replaced 100 times, how many times would you expect to draw a green marble?</p>
<p>5. What is the probability that someone's favorite winter activity is building a snowman? Write the probability as a fraction.</p>	<p>6. If 500 people had responded, how many would have been expected to list sledding as their favorite winter activity? Round to the nearest whole person.</p>

9-7**Practice: Word Problems*****Independent and Dependent Events***

<p>1. SAFETY Eighty percent of all California drivers wear seat belts. If three drivers are pulled over, what is the probability that all would be wearing their seat belts? Write as a percent to the nearest tenth.</p>	<p>2. VEGETABLES A nationwide survey showed that 65% of all children in the United States dislike eating vegetables. If three children are chosen at random, what is the probability that all three dislike eating vegetables? Write as a percent to the nearest tenth.</p>
<p>3. QUALITY In a shipment of 50 calculators, 4 are defective. Two calculators are randomly selected and tested. What is the probability that both are defective if the first one is not replaced after being tested?</p>	<p>4. MARBLES A bag contains 6 green marbles, 2 blue marbles, and 3 white marbles. Gwen draws one marble from the jar, and then Jeff draws one marble from the remaining marbles. What is the probability that Gwen draws a blue marble and Jeff draws a white marble?</p>
<p>5. DEMONSTRATION Ms. Morris needs two students to help her with a demonstration for her class of 12 girls and 14 boys. She randomly chooses two students. What is the probability that she chooses two girls?</p>	<p>6. SURVEY Ruben surveyed his class and found that 4 out of 22 students walk to school. If two of the 22 students are selected at random, what is the probability that both walk to school?</p>

10-1

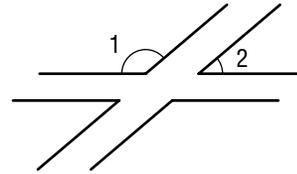
Practice: Word Problems

Angles

1. CLOCKS The time shown on the clock is 11:05. Starting at this time, approximately what time will it be when the hands form an obtuse angle?



2. AIRPORT The runways at a local airport are sketched in the figure. Classify $\angle 1$ and $\angle 2$ as *acute*, *obtuse*, *right*, or *straight*.



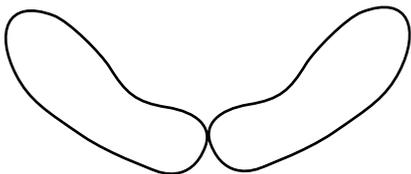
3. ALPHABET Which of the following letters contain at least one acute angle?

A E L W

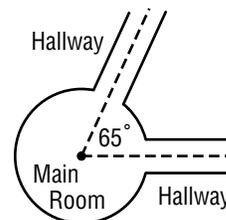
4. CLOCKS The time shown on the clock is 12:07. After 20 minutes have gone by, will the angle formed by the hour and minute hands be *acute*, *obtuse*, *right*, or *straight*?



5. BALLET When a ballet dancer's feet are in first position, the heels are touching, and the feet are turned out. A dancer with excellent technique can position his or her feet so that they are nearly in a straight line. Isabella is practicing her technique. Classify the angle her feet form as *acute*, *obtuse*, or *right*.



6. ARCHITECTURE The plans for a new aquarium call for several hallways of exhibits leading out of a circular main room. Because of the size of the tanks that will be used, the angle formed between two adjacent hallways can be no smaller than 65° . What is the maximum number of hallways that can be built leading out of the main room?



10-2**Practice: Word Problems****Making Circle Graphs**

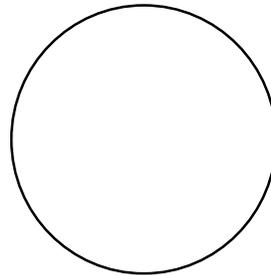
LANGUAGES For Exercises 1 and 2, use the table that shows the number of people that speak the five languages that are spoken by the most people in the world.

Languages Spoken by the Most People	
Language	Speakers (millions)
Chinese, Mandarin	874
Hindi	366
English	341
Spanish	322
Bengali	207

1. Find the degrees for each part of a circle graph that shows the data.

2. Make a circle graph of the data. Which three languages account for 41% of the total?

Languages Spoken by the Most People

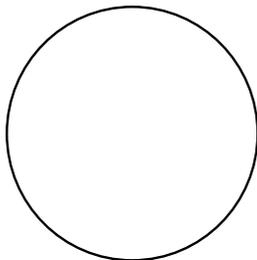


MILITARY For Exercises 3 and 4, use the table that shows the number of people active in the United States military in 2002.

United States Military, Active Duty, 2002	
Branch	Personnel (thousands)
Army	486
Navy	385
Marine Corps	174
Air Force	368
Coast Guard	38

3. Make a circle graph of the data.

United States Military Personnel Active Duty, 2002



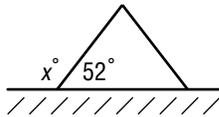
4. Which two branches taken together account for almost half of the total?

10-3

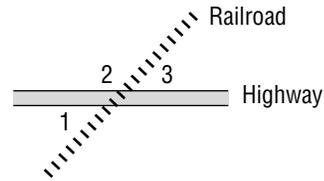
Practice: Word Problems

Angle Relationships

1. PYRAMIDS A side view of the Great Pyramid at Giza is shown below. The sides of the pyramid make an angle of 52° with respect to the ground. What is the value of x ?

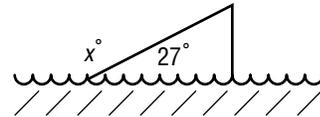


2. RAILROAD A map shows a railroad crossing a highway, as shown below. Which of the numbered angles are vertical angles?

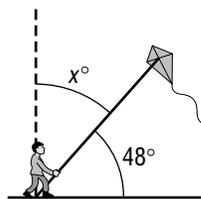


3. RAILROAD Refer to the map shown in Exercise 2. If $m\angle 1$ is 64° , what is the measure of $\angle 2$?

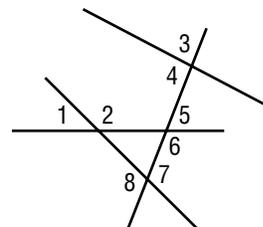
4. SKIING A ski jump makes an angle of 27° with respect to the water as shown below. How are the 27° angle and the unknown angle related? What is the value of x ?



5. KITES A kite string makes an angle of 48° with respect to the ground as shown below. The dashed line is vertical and the ground is horizontal. How are the 48° angle and the unknown angle related? What is the value of x ?



6. GAMES In a game of pick-up-sticks, the last 4 sticks are shown below. Which of the numbered angles are vertical angles?



10-4

Practice: Word Problems

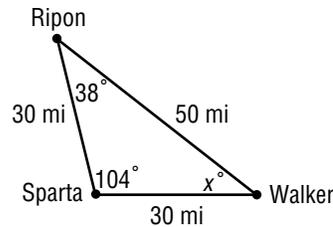
Triangles

1. TAILORING Each lapel on a suit jacket is in the shape of a triangle. The three angles of each triangle measure 47° , 68° , and 65° . Classify the triangle by its angles.

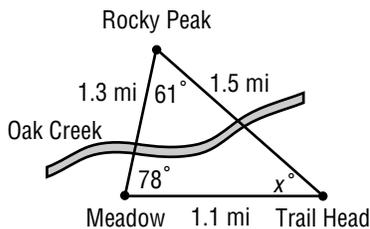
2. FLAGS A naval distress signal flag is in the shape of a triangle. The three sides of the triangle measure 5 feet, 9 feet, and 9 feet. Classify the triangle by its sides.

3. CARPENTRY The supports of a wood table are in the shape of a right triangle. Find the third angle of the triangle if the measure of one of the angles is 23° .

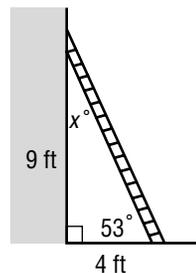
4. MAPS The three towns of Ripon, Sparta, and Walker form a triangle as shown below. Classify the triangle by its angles and by its sides. What is the value of x in the triangle?



5. HIKING The figure shows the Oak Creek trail, which is shaped like a triangle. Classify the triangle by its angles and by its sides. What is the value of x in the figure?



6. LADDER The figure shows a ladder leaning against a wall, forming a triangle. Classify the triangle by its angles and by its sides. What is the value of x in the figure?

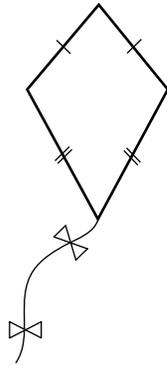


10-5

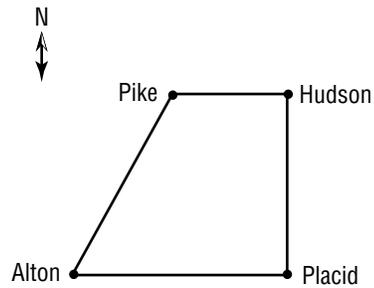
Practice: Word Problems

Quadrilaterals

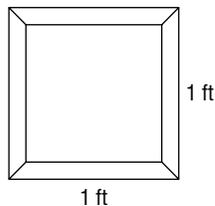
1. KITES A kite is shown below. What is the best name to classify the shape of the kite? Explain.



2. MAPS A map showing the road connecting the towns of Pike, Hudson, Placid, and Alton is shown. The road connecting Pike and Hudson is parallel to the road connecting Alton and Placid. What is the best name to classify the shape of the roads connecting the four towns? Explain.



3. ART A picture frame is shown below. What is the *best* name to classify the shape of the frame?



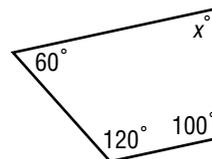
4. SCHOOL SUPPLIES The side view of an eraser is shown below. What is the best name to classify the shape of the eraser?



5. PARTY The front of a birthday party invitation is shown below. Find the measure of the missing angle.

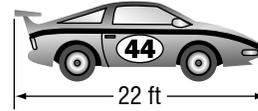


6. TABLE The top of Mr. Bautista's new coffee table is shown below. Find the measure of the missing angle.



10-6**Practice: Word Problems****Similar Figures**

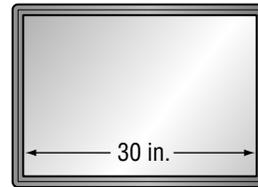
MODEL CARS For Exercises 1 and 2, use the following information. A scale model racing car is 11 inches long, 3 inches wide, and 2 inches tall. The actual racing car is shown at the right.



1. How wide is the actual racing car?

2. How tall is the actual racing car?

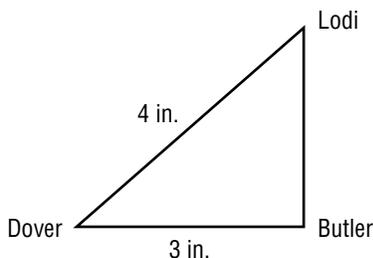
PHOTOGRAPHY For Exercises 3–4, use the given information. James wants to enlarge a photograph that is 6 inches wide and 4 inches tall so that it fits into the frame shown.



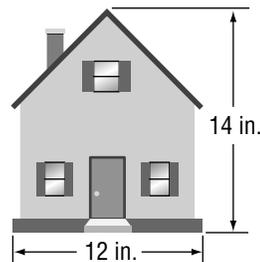
3. How tall must the frame be for the picture to fit?

4. Suppose James cuts 1 inch from the width of the photo, so that it is 5 inches wide, before he makes the enlargement. How tall will the frame have to be for the picture to fit?

5. **MAPS** A map below shows the towns of Dover, Butler, and Lodi. If the actual distance between Dover and Butler is 24 miles, how far is it from Dover to Lodi?



6. **BLUEPRINTS** A blueprint for a house is shown below. If the front of the house is actually 30 feet wide, how tall is the house?

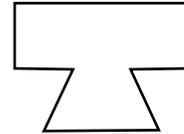


10-7**Practice: Word Problems*****Polygons and Tessellations***

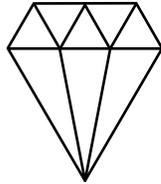
- 1. ROYALTY** The outline of a crown worn by a king is shown below. Is the figure a polygon? If it is, classify the polygon and state whether it is regular. If it is *not* a polygon, explain why.



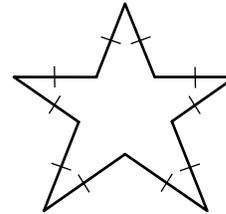
- 2. ALCHEMY** The symbol shown is one of the signs for *salt alkali* used in 17th-century chemistry. Is the symbol a polygon? If it is, classify the polygon and state whether it is regular. If it is *not* a polygon, explain why.



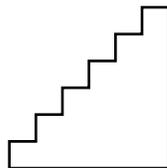
- 3. JEWELRY** The symbol shown is often used to represent gems. Is the symbol a polygon? If it is, classify the polygon and state whether it is regular. If it is *not* a polygon, explain why.



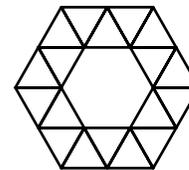
- 4. SYMBOLS** The 5-pointed star shown has sides of equal length. Is the symbol a polygon? If it is, classify the polygon and state whether it is regular. If it is *not* a polygon, explain why.



- 5. STAIRS** The figure shows a side view of a set of stairs. Is the figure a polygon? If it is, classify the polygon and state whether it is regular. If it is *not* a polygon, explain why.



- 6. TESSELLATIONS** Identify the polygons that are used to create the tessellation shown in the figure.



10-8

Practice: Word Problems

Translations

MAPS For Exercises 1–4, use the map at the right.



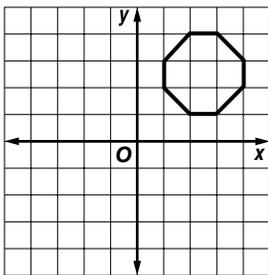
1. Stanley's school is located at the corner of Center and Elmwood. The library is located at the corner of Dodge and Delaware. Describe Stanley's walk from school to the library as an ordered pair of the number of blocks.

2. After he goes to the library, Stanley goes to his Aunt Jeanne's house at the corner of California and Harrison. Describe Stanley's walk from the library to his aunt's house as an ordered pair of the number of blocks.

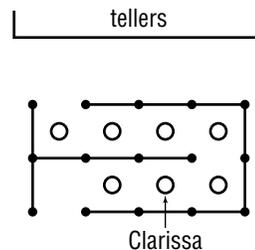
3. If a bus picks up passengers at the corner of New York and Maple and drives 2 blocks south and 3 blocks west, where does the bus end up?

4. Organizers of a walkathon want to map out a route that will lead people from the corner of Center and Kensington to the corner of California and Maple. Write a coordinate pair that describes the most direct route.

5. **GEOMETRY** The figure shows an octagon plotted on a coordinate system. The figure is to be translated by 5 units left and 5 units down. Graph the translated image of the figure.



6. **BANKS** Clarissa is waiting in line at the bank. There are several people in line in front of her. Describe the path Clarissa must take to get to the front of the line if each time she moves up in line by one position is considered one unit.

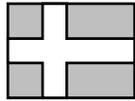


10-9

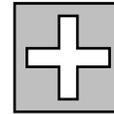
Practice: Word Problems

Reflections

1. FLAGS The figure shows a flag similar to the national flag of Denmark. How many lines of symmetry does the flag have? Draw all lines of symmetry.



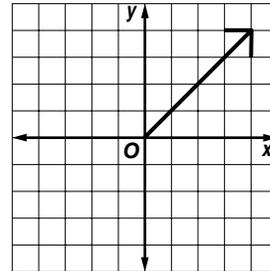
2. FLAGS The figure shows a flag similar to the national flag of Switzerland. How many lines of symmetry does the flag have? Draw all lines of symmetry.



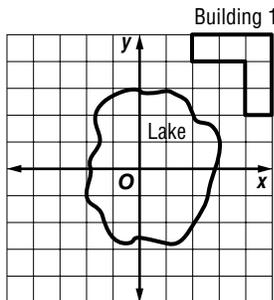
3. INTERIOR DESIGN An interior designer has been hired to decorate a room that has the shape of a regular hexagon. Before beginning work, the designer studies the symmetry of the room. How many lines of symmetry does the room have? Draw all lines of symmetry on the figure.



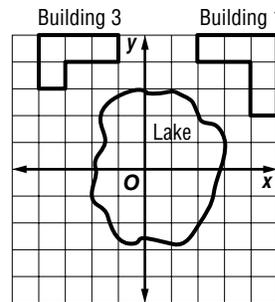
4. ASTROLOGY The figure shows the astrological symbol for Sagittarius plotted on a coordinate system. Reflect the symbol across the x -axis. Graph the reflected image.



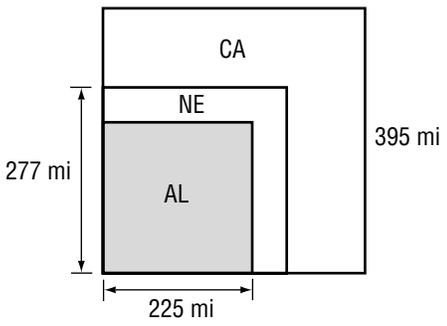
5. ARCHITECTURE A corporate plaza is to be built around a small lake. Building 1 has already been built. Suppose there are axes through the lake as shown. Show where Building 2 should be built if it will be a reflection of Building 1 across the y -axis followed by a reflection across the x -axis.



6. ARCHITECTURE Use the information from Exercise 5. Suppose that a third building is to be built as shown. To complete the business park, show where a fourth building should be built if it is a reflection of Building 3 across the x - and y -axis.



11-1**Practice: Word Problems****Squares and Square Roots**

<p>1. FERTILIZER John bought a bag of lawn fertilizer that will cover 400 square feet. What are the dimensions of the largest square plot of lawn that the bag of fertilizer will cover?</p>	<p>2. GEOMETRY The area A of a circle in square feet with a radius r in feet is given approximately by the formula $A \approx 3.14r^2$. What is the approximate area of a circle with a radius of 3 feet?</p>
<p>3. MOTION The time t in seconds for an object dropped from a height of h feet to hit the ground is given by the formula $t = \sqrt{\frac{2h}{32}}$. How long will it take an object dropped from a height of 500 feet to hit the ground? Round to the nearest tenth.</p>	<p>4. PACKAGING A cardboard envelope for a compact disc is a square with an area of 171.61 square centimeters. What are the dimensions of the envelope?</p>
<p>5. GEOGRAPHY Refer to the squares below. They represent the approximate areas of California, Alabama, and Nebraska. Find the area of Alabama.</p> 	<p>6. Use the figure in Exercise 5. How much larger is California than Nebraska?</p>

11-2**Practice: Word Problems****Estimating Square Roots**

1. GEOMETRY The diameter d of a circle with area A is given by the formula $d = \sqrt{\frac{4A}{\pi}}$. What is the diameter of a circle with an area of 56 square inches? Use 3.14 for π and round to the nearest tenth.

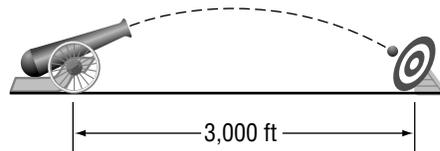
2. FENCING Carmen wants to buy fencing to enclose a square garden with an area of 500 square feet. How much fencing does Carmen need to buy? Round to the nearest tenth.

3. OCEANS The speed v in feet per second of an ocean wave in shallow water of depth d in feet is given by the formula $v = \sqrt{32d}$. What is the speed of an ocean wave at a depth of 10 feet? Round to the nearest tenth.

4. LIGHTING A new flashlight has a beam whose width w at a distance d from the flashlight is given by the formula $w = 1.2\sqrt{d}$. What is the width of the beam at a distance of 30 feet? Round to the nearest tenth.

5. SOUND The speed of sound in air c in meters per second at a temperature T in degrees Celsius is given approximately by the formula $c = \sqrt{402(T + 273)}$. What is the speed of sound in air at a temperature of 25 degrees Celsius? Round to the nearest tenth.

6. PROJECTILES The muzzle velocity v in feet per second necessary for a cannon to hit a target x feet away is estimated by the formula $v = \sqrt{32x}$. What muzzle velocity is required to hit a target 3,000 feet away? Round to the nearest tenth.

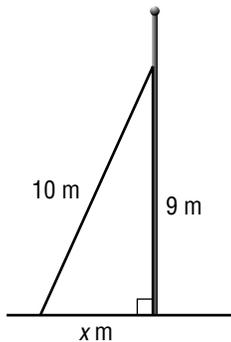


11-3**Practice: Word Problems*****The Pythagorean Theorem***

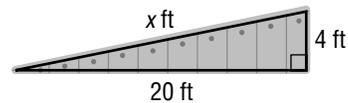
1. ORIGAMI Chee has a piece of paper measuring 8.5 inches by 8.5 inches. If she folds the paper diagonally in half, how long is the folded side? Round to the nearest tenth.

2. COMPUTERS In a computer catalog, a computer monitor is said to be 19 inches. This distance is the diagonal distance across the screen. If the screen is 10 inches high, what is the width of the screen? Round to the nearest tenth.

3. ANTENNAS A wire 10 meters long is supporting a utility pole. The wire is anchored to the ground and is attached to the pole 9 meters above the ground. What is the distance from the bottom of the pole to the point where the wire is attached to the ground? Round to the nearest tenth.



4. RAMPS Crystal wants to build a ramp that will rise 4 feet over a horizontal distance of 20 feet. How long will the ramp be? Round to the nearest tenth.



5. POOLS Salomon swims diagonally across his pool every day. If Salomon's pool is 4 meters wide and 16 meters diagonally across, how long is his pool, to the nearest tenth of a meter?

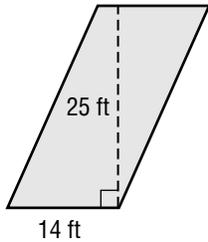
6. FRAMES Rosa has a picture frame that measures 12 inches by 18 inches. What is the diagonal distance across the frame? Round to the nearest tenth.

11-4

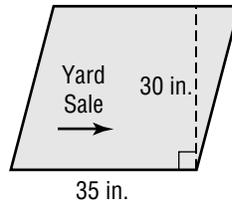
Practice: Word Problems

Area of Parallelograms

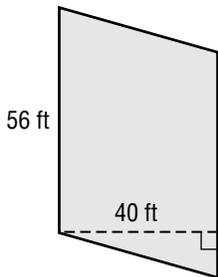
- 1. SAILS** Joyce wants to construct a sail with the dimensions shown. How much material will be used?



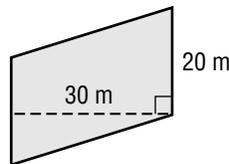
- 2. SIGNS** Pedro wants to make the sign in the shape shown and needs to know how much material will be needed. What is the area of the sign?



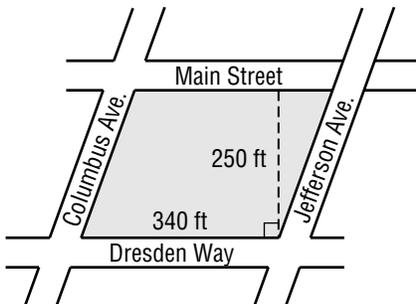
- 3. SHADING** Alma's engineering firm must determine the area of the largest noontime shadow that a proposed building design will create. What is the area of the shadow?



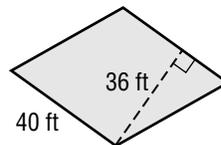
- 4. POOLS** Tamika has designed a pool in the shape shown. What is the area of the bottom of the pool if the surface is perfectly flat?



- 5. CITY PLANNING** Two parallel streets are cut across by two other parallel streets as shown in the figure, cutting off a parcel of land in the shape of a parallelogram. Find the area of the parcel of land.



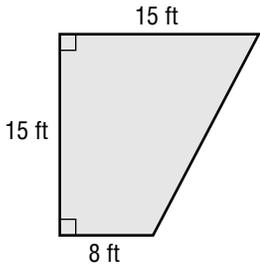
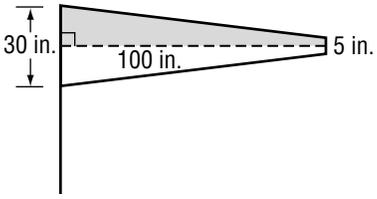
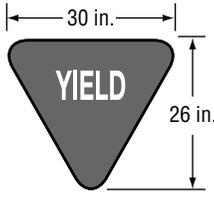
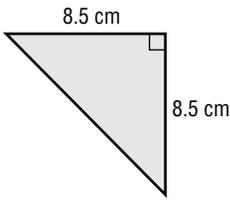
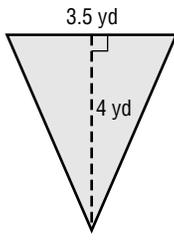
- 6. TARPS** Neka wants to cut a tarp in the shape shown. What is the minimum amount of canvas cloth that he will need?



11-5

Practice: Word Problems

Area of Triangles and Trapezoids

<p>1. GEOGRAPHY Arkansas has a shape that is similar to a trapezoid with bases of about 182 miles and 267 miles and a height of about 254 miles. Estimate the area of the state.</p>	<p>2. PATIOS Greta is making a patio with the dimensions given in the figure. What is the area of the patio?</p> 
<p>3. FLAGS Malila wants to make the International Marine Signal flag shown which represents the number six. What is the area of the flag?</p> 	<p>4. SIGNS Estimate the area of the yield sign.</p> 
<p>5. TILING A ceramics company wants to produce tiles in the shape shown. What is the area of the surface of each tile?</p> 	<p>6. GARDENING Kinu wants to buy topsoil for a section of her garden that has the dimensions shown in the figure. What is the area of this section of Kinu's garden?</p> 

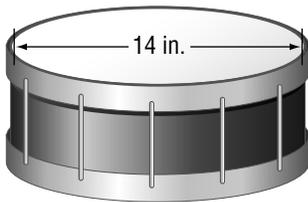
11-6**Practice: Word Problems****Area of Circles**

- 1. POOLS** Susan designed a circular pool with a diameter of 25 meters. What is the area of the bottom of the pool? Round to the nearest tenth.

- 2. MONEY** Find the area of the coin to the nearest tenth.

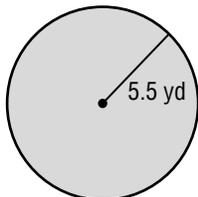


- 3. DRUMS** What is the area of the drumhead on the drum shown below? Round to the nearest tenth.



- 4. PIZZA** Estimate the area of the top of a round pizza that has a diameter of 16 inches. Round to the nearest tenth.

- 5. GARDENING** Jane needs to buy mulch for the garden with the dimensions shown in the figure. For how much area does Jane need to buy mulch? Round to the nearest tenth.



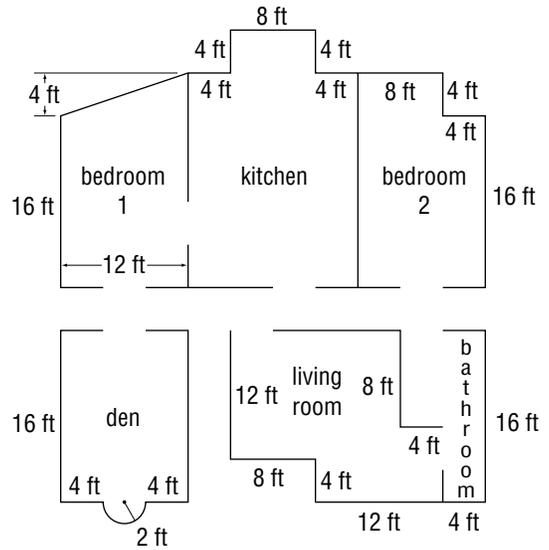
- 6. UTILITIES** What is the area of the top surface of a circular manhole cover that has a radius of 30 centimeters? Round to the nearest tenth.

11-7

Practice: Word Problems

Area of Complex Figures

ARCHITECTURE For Exercises 1–6 use Jaco’s preliminary design of his vacation house at the right. Round to the nearest tenth if necessary.



<p>1. What type of figure is bedroom 1? Find the area of bedroom 1.</p>	<p>2. What is the area of the bedroom 2? What figures did you use to find the area?</p>
<p>3. What is the area of the bathroom? What are the dimensions of the figures you used to find this area?</p>	<p>4. What is the area of the living room? How many figures did you use to find this area?</p>
<p>5. What is the area of the den? What would the area of the den be if the semicircular window were removed and replaced with a flat window?</p>	<p>6. What is the area of the kitchen? If Jaco adds a rectangular cooking island in the middle of the kitchen with dimensions 6 feet by 4 feet, how many square feet of walking space will be left?</p>

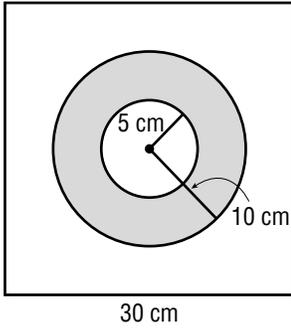
11-8

Practice: Word Problems

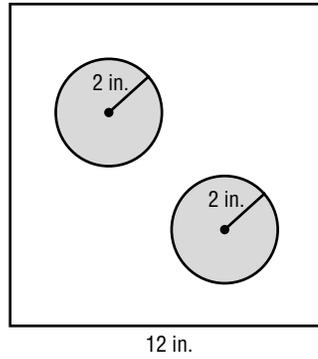
Area Models and Probability

GAMES Each figure represents a square dartboard. If it is equally likely that a thrown dart will land anywhere on the dartboard, find the probability that it lands in the shaded region. Round to the nearest tenth.

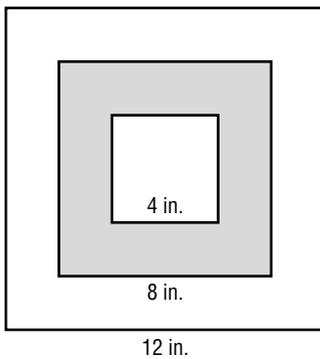
1.



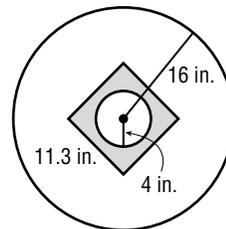
2.



3.



4.



12-1**Practice: Word Problems*****Drawing Three-Dimensional Figures***

- 1. ARCHITECTURE** The Transamerica Pyramid, built from 1969 to 1972, towers above the San Francisco skyline.

Draw the top, side, and front views of the Transamerica building.

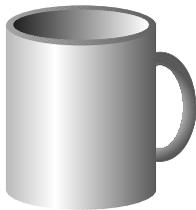


- 2. MONUMENTS** Since its completion in 1965, Eero Saarinen's 630-foot Gateway Arch has stood above St. Louis.

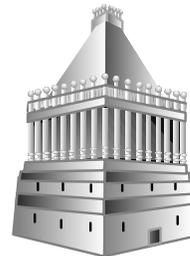


Draw the top, side, and front views of the Gateway Arch.

- 3. GRAPHICS** Dan is creating a computer-generated image of a coffee cup. To do this, he needs to enter the top, side, and front views of the cup. Draw the views that Dan should enter.

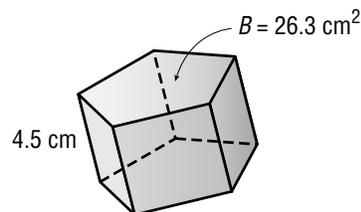


- 4. HISTORY** The Mausoleum at Halicarnassus is one of the Seven Wonders of the Ancient World. Draw a top view, a side view, and a front view of the mausoleum without the chariot statue at the top.



12-2**Practice: Word Problems*****Volume of Rectangular Prisms***

- | | |
|--|--|
| <p>1. PACKAGING A cereal box has a length of 8 inches, a width of $1\frac{3}{4}$ inches, and a height of $12\frac{1}{8}$ inches. What is the volume of the cereal box?</p> | <p>2. FOOD STORAGE Nara wants to determine how much ice it will take to fill her cooler. If the cooler has a length of 22 inches, a width of 12 inches, and a height of $10\frac{1}{2}$ inches, how much ice will her cooler hold?</p> |
| <p>3. TRANSPORTATION The cargo-carrying part of Billy's truck has a length of 8.3 meters, a width of 3 meters, and a height of 4.2 meters. What is the maximum volume of sand that Billy's truck can carry?</p> | <p>4. PLUMBING Alexia's bathroom has a tub in the shape of a rectangular prism with a length of 1.5 meters, a width of 0.5 meter, and a height of 0.4 meter. How many cubic feet of water can it hold?</p> |
| <p>5. PACKAGING A box of tissues has a length of 11.2 centimeters, a width of 11.2 centimeters, and a height of 13 centimeters. What is the volume of the tissue box?</p> | <p>6. GEOMETRY A <i>pentagonal prism</i> is a prism that has bases that are pentagons. Use $V = Bh$ where B is the area of the base, to find the volume of the pentagonal prism below.</p> |



12-3**Practice: Word Problems*****Volume of Cylinders***

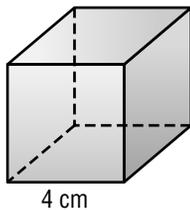
<p>1. WATER STORAGE A cylindrical water tank has a diameter of 5.3 meters and a height of 9 meters. What is the maximum volume that the water tank can hold? Round to the nearest tenth.</p>	<p>2. PACKAGING A can of corn has a diameter of 6.6 centimeters and a height of 9.9 centimeters. How much corn can the can hold? Round to the nearest tenth.</p>
<p>3. CONTAINERS Tionna wants to determine the maximum capacity of a cylindrical bucket that has a radius of 6 inches and a height of 12 inches. What is the capacity of Tionna's bucket? Round to the nearest tenth.</p>	<p>4. DESIGN Rodolfo is designing a new, cylindrical drinking glass. If the glass has a diameter of 8 centimeters and a height of 12.8 centimeters, what is its volume? Round to the nearest tenth.</p>
<p>5. PAINT A can of paint is 15 centimeters high and has a diameter of 13.6 cm. What is the volume of the can? Round to the nearest tenth.</p>	<p>6. SPICES A spice manufacturer uses a cylindrical dispenser like the one shown. Find the volume of the dispenser to the nearest tenth.</p> <div></div>

12-4**Practice: Word Problems****Surface Area of Rectangular Prisms**

- 1. PACKAGING** A packaging company needs to know how much cardboard will be required to make boxes 18 inches long, 12 inches wide, and 10 inches high. How much cardboard will be needed for each box if there is no overlap in the construction?

- 2. INSULATION** Jane needs to buy insulation for the inside of a truck container. The container is a rectangular prism 15 feet long, 8 feet wide, and $7\frac{1}{2}$ feet high. How much insulation should Jane buy if all inside surfaces except the floor are to be insulated?

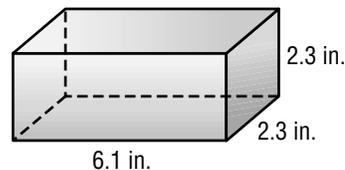
- 3. ICE** Suppose the length of each edge of a cube of ice is 4 centimeters. Find the surface area of the cube.



- 4. ICE** Suppose you cut the ice cube from Exercise 3 in half horizontally into two smaller rectangular prisms. Find the surface area of one of the two smaller prisms.

- 5. CONTAINERS** What is the total surface area of the inside and outside of a container in the shape of a rectangular prism with length of 5 meters, width of 3 meters, and height of 2.2 meters?

- 6. TOYS** Oscar is making a play block for his baby sister by gluing fabric over the entire surface of a foam block. How much fabric will Oscar need?



12-5**Practice: Word Problems****Surface Area of Cylinders**

<p>1. PACKAGING What is the area of the label on a box of oatmeal with a radius of 9.3 centimeters and a height of 16.5 centimeters? Round to the nearest tenth.</p>	<p>2. TIRES Betty wants to know the total surface area of the tread on one of her tires. If the diameter of the tire is 18 inches and the width of the tire is 5 inches, what is the total surface area of the tire's tread? Round to the nearest tenth.</p>
<p>3. CANS A cylindrical can has a diameter of 6 inches and a height of 7.3 inches. What is the surface area of the can? Round to the nearest tenth.</p>	<p>4. CANS A cylindrical can has a height of 14 centimeters and a radius of 4.2 centimeters. Find the surface area of the can. Round to the nearest tenth.</p>
<p>5. MANUFACTURING How much sheet metal is required to make a cylindrical trash can with a diameter of 2 feet and height of $4\frac{1}{4}$ feet? Round to the nearest tenth. (<i>Hint:</i> Do not include the top.)</p>	<p>6. PLUMBING How much steel is needed to make a hollow pipe with a radius of 3 inches and a height of 15 inches? Round to the nearest tenth.</p>

12-6**Practice: Word Problems*****Precision and Measurement***

FOOTBALL For Exercises 1–3, use the information about **Quentin Griffin**.

University of Oklahoma running back Quentin Griffin ran 248 yards on the ground against No. 2 Texas to earn the USATODAY.com Player of the Week honors. The senior added two touchdowns in the fourth quarter to lift the third-ranked Oklahoma Sooners past the Texas Longhorns 35-24.

<p>1. How many significant digits are in the measurement of the distance that Quentin Griffin ran?</p>	<p>2. What is the precision unit on a football field? Would the distance measurement be more precise if the field was measured in meters? Explain.</p>
<p>3. How many significant digits are in the score of the game?</p>	<p>4. LAND SPEED On October 15, 1997, Andy Green set the land speed record of 763.035 miles per hour. How many significant digits are in the measurement of the land speed record?</p>
<p>5. TRACK The record for the men's high jump is held by Javier Sotomayor (Cuba), who became world champion with a distance of 2.45 meters on July 27, 1993, in Salamanca, Spain. How many significant digits are in the measurement of the high jump record?</p>	<p>6. OCEANOGRAPHY On March 24, 1995, the Japanese probe <i>Kaiko</i> recorded the depth of the Marianas Trench, the deepest point in the ocean, at 10,911 meters or 35,797 feet. Which expression of the measurement is more precise? Explain.</p>