NAME _____ DATE _____ PERIOD _____

6-1 Skills Practice

Ratios

Express each ratio as a fraction in simplest form.

1. 8 pencils to 12 pens
2. 42 textbooks to 28 students
3. 27 rooms to 48 windows
4. 15 angel fish to 75 fish
5. 75 cats to 100 dogs
6. 6 aces out of 24 serves
7. 42 flowers to 7 vases
8. 14 boys to 21 girls
9. 50 nickels out of 125 coins
10. 9 children to 24 adults
11. 3 gallons to 15 quarts
12. 30 feet to 11 yards
13. 18 inches to 3 feet
14. 1 yard to 1 foot
15. 2 cups to 4 pints
16. 12 seconds to 1 minute
17. 3 pounds to 15 ounces
18. 15 inches to 2 yards
19. 1 pint to 4 quarts
20. 3 minutes to 1 hour
21. 8 ounces to 2 pounds
22. 7 quarts to 2 gallons
23. 6 ounces to 1 cup
24. 2 feet to 3 inches

Lesson 6-1

NAME _____ DATE _____ PERIOD _____

6-1 Practice

Ratios

Express each ratio as a fraction in simplest form.

1. 56 pencils to 64 erasers

2. 25 calculators to 20 students

3. 36 cassettes to 60 CDs

4. 18 minnows to 27 fish

5. 26 tents to 65 campers

6. 49 apples out of 63 fruit

7. 45 out of 75 days

8. 60 forks to 144 spoons

9. 112 out of 200 pages

10. 36 balls to 81 players

11. 6 pounds to 256 ounces

12. 5 hours to 720 minutes

13. 9 gallons to 48 quarts

14. 24 feet to 30 yards

15. 420 seconds to 10 minutes

16. 96 inches to 9 feet

17. 64 cups to 50 pints

18. 35 pints to 7 gallons

19. 4 inches to 3 yards

20. 780 seconds to 1 hour

21. HOMECOMING At a homecoming game, there are 630 students and 1,080 alumni in attendance. Express the ratio of students to alumni as a fraction in simplest form. Explain its meaning.

NAME _____ DATE _____ PERIOD _____

6-2 Practice

Unit Rates

Express each rate as a unit rate. Round to the nearest tenth or nearest cent, if necessary.

1. $4.60 for 5 cans of soup

2. $51 for a box of 75 tiles

3. 652 miles in 9 days

4. 116 meters in 12 seconds

5. 176 new employees in 22 years

6. 34 yards for 6 costumes

7. 55 pages in 25 minutes

8. $3015 from 36 people

9. **CAMP** Happy Times Summer Camp has 356 campers and 38 counselors. PlayDay Summer Camp has 219 campers and 28 counselors. Which camp has the lower rate of campers to counselors?

10. **ROLLER COASTER** A roller coaster can accommodate 346 riders in 20 minutes. How many riders could ride in 90 minutes?

11. **BAGELS** The bakers at Joey's Bagels can make 340 bagels in 4 hours. How many bagels could the bakers make in 10 hours?

12. **CEREAL** The prices for various sizes of Health Crunch cereal are given in the table at the right. Which size has the best cost per ounce?

Size (oz)	Price
11	$4.75
15	$4.85
19.1	$5.89

13. **MUSIC** The Music Factory offers 45-minute music lessons for $40. The Music Makers offers 60-minute lessons for $55. Which is the better deal?

14. **RUNNING** Leslie ran a 5-kilometer race in 22 minutes. Jorge ran a 2-kilometer race in 8.5 minutes. Which runner ran at the faster rate?

15. **SEWING** It took Michala 4 hours to sew 9 scarves. How many scarves could she make in 24 hours?

NAME _____ DATE _____ PERIOD _____

6-2 Skills Practice

Unit Rates

Express each rate as a unit rate. Round to the nearest tenth or nearest cent, if necessary.

1. $9 for 6 cans of soup

2. $39 for a case of 75 bananas

3. 108 miles in 6 days

4. 51 meters in 8 seconds

5. 21 new pairs of sneakers in 7 years

6. 52 feet for 8 costumes

7. 40 sneezes in 20 minutes

8. $2702 from 28 people

9. **JUICE** A 64-ounce container of sports juice costs $6.50. A 48-ounce container of the same juice costs $4.25. Which size container is the better buy?

10. **KNITTING** Charmaine can knit 15 rows in 22 minutes. How many full rows could she knit in 90 minutes?

11. **STUDENTS** There are 156 sixth graders and 7 sixth-grade teachers. There are 120 fifth graders and 5 fifth-grade teachers. Which grade has the lower student to teacher ratio?

12. **PHONES** Cell phone Company X charges $15 for 120 minutes. Cell phone Company Y charges $25.95 for 300 minutes. Which company has the better per minute rate?

13. **ANIMALS** During normal sleep, a bear's heart beats about 50 times a minute. In its deepest state of hibernation, a bear's heart may beat 50 times in 6 minutes. During deep hibernation, how many times would the bear's heart beat in 45 minutes?

14. **PLANES** An airplane traveled 1536 miles in 3 hours. At this same rate, how far could the plane travel in 8 hours?

15. **ICE CREAM** An ice cream store makes 144 quarts of ice cream in 8 hours. How many quarts could be made in 12 hours?

Lesson 6-2

NAME _____ DATE _____ PERIOD _____

6-3 Practice

You must show work on separate paper!

Converting Rates and Measurements

Convert each rate using dimensional analysis. Round to the nearest hundredth if necessary.

1. 18 m/min = ■ cm/s
2. 5.7 gal/h = ■ c/min
3. 264 yd/s = ■ mi/h
4. 2 qt/min = ■ gal/h
5. 99 in./s = ■ mi/day (1 day = 24 h)
6. 154 mi/h = ■ in./s
7. 44 mi/m = ■ ft/s
8. 15 oz/min = ■ gal/h

Complete each conversion. Round to the nearest hundredth if necessary.

9. 10 cm ≈ ■ in.
10. 300 gal ≈ ■ L
11. 250 g ≈ ■ oz
12. 5.5 kg ≈ ■ lb
13. 145 m ≈ ■ mi
14. 9.5 L ≈ ■ pt
15. 13 yd ≈ ■ m
16. 1,095 mi ≈ ■ km

Convert each rate using dimensional analysis. Round to the nearest hundredth if necessary.

17. 88 mi/h ≈ ■ km/min
18. 10 ft/min ≈ ■ m/h
19. 165 L/h ≈ ■ qt/min
20. 26 yd/s ≈ ■ km/h
21. 474 gal/day ≈ ■ L/week
22. 33.6 m/s ≈ ■ ft/min
23. 22 fl oz/min ≈ ■ mL/s
24. 299 km/h ≈ ■ mi/min

25. **TRACK AND FIELD** Rita sprinted 77 feet in 10 seconds. How many miles per hour is this?

26. **TRAVEL** Lisa is traveling to Europe. The information from the airlines said that she is only allowed to check 25 kilograms worth of baggage. How many pounds is this?

27. **SPACE SHUTTLE** The space shuttle travels at an orbital speed of about 17,240 miles per hour. How many meters per minute is this?

* Remember.... the Process!!

NAME _____ DATE _____ PERIOD _____

6-4 Skills Practice

Proportional and Nonproportional Relationships

Determine whether the set of numbers in each table is proportional. Explain.

1.

Number of Socks	1	2	3	4
Cost	$2	$4	$6	$6

2.

Number of Guests	2	4	6	8
Cookies	4	8	12	16

3.

Days	1	3	5	6
Pages Read	100	300	550	600

4.

Cups of Flour	2	4	8	10
Loaves of Bread	1	2	4	5

For Exercises 5 and 6, complete each table. Determine whether the pattern forms a proportion.

5. **BABY-SITTING** Aliya earns $7 per hour baby-sitting her neighbors.

Hours	1				
Earnings	$7				

6. **PIZZA** Antonio's Pizzaria charges $10 for a large pizza, plus $1.50 for each additional topping.

Number of Toppings	1				
Cost					

7. **TRAVELING** On a cross-country road trip, a family drives 240 miles each day. Write and solve an equation to determine how far the family has traveled after 4 days.

NAME _____ DATE _____ PERIOD _____

6-4 Practice

Proportional and Nonproportional Relationships

Determine whether the set of numbers in each table is proportional. Explain.

1.

Cups of Rice	1	2	2.5	3
Cups of Water	1.5	3	3.75	4.5

2.

Miles driven	1	2	6	9
Toll fare	$1.07	$1.14	$1.42	$1.63

For Exercises 3 and 4, write and solve an equation.

3. **JOBS** Sharif started a new job working 15 hours a week. After how many weeks will he have worked a total of 75 hours?

4. **GARDENING** During its first 50 days of growth, a sunflower grows about 4 cm per day. Using this rate, after how many days will a sunflower be 60 cm tall?

For Exercises 5–6, complete each table. Determine whether the pattern forms a proportion.

5. **TEXT MESSAGING** It costs Victoria $0.10 to send a text message.

Number of Messages	4				
Cost					

6. **WATER CONSUMPTION** Water flows out of a kitchen faucet at about 1.5 gallons per minute.

Minutes	0.5				
Gallons of Water					

7. **COOKING** The amount of time it takes to cook a turkey increases with the weight of the turkey. It is recommended that you cook a 10-lb turkey for 3 hours. An extra 12 minutes of cooking time is necessary for each additional pound of turkey. Is the cooking time proportional to the weight of the turkey? Explain your reasoning.

NAME _____ DATE _____ PERIOD _____

6-5 Skills Practice

Solving Proportions

Determine whether each pair of ratios forms a proportion.

1. $\frac{1}{5}, \frac{4}{20}$
2. $\frac{3}{8}, \frac{12}{32}$
3. $\frac{4}{5}, \frac{9}{10}$
4. $\frac{12}{20}, \frac{18}{30}$
5. $\frac{3}{4}, \frac{27}{36}$
6. $\frac{10}{18}, \frac{2}{9}$
7. $\frac{4}{9}, \frac{2}{3}$
8. $\frac{15}{18}, \frac{10}{12}$
9. $\frac{15}{24}, \frac{3}{8}$
10. $\frac{36}{72}, \frac{50}{100}$
11. $\frac{10}{8.4}, \frac{5}{4.2}$
12. $\frac{12}{4.8}, \frac{9}{3.2}$

ALGEBRA Solve each proportion.

13. $\frac{8}{4} = \frac{t}{8}$
14. $\frac{n}{9} = \frac{4}{18}$
15. $\frac{3}{v} = \frac{12}{32}$
16. $\frac{25}{60} = \frac{s}{12}$
17. $\frac{21}{28} = \frac{3}{w}$
18. $\frac{c}{12} = \frac{5}{6}$
19. $\frac{4}{r} = \frac{5}{20}$
20. $\frac{12}{18} = \frac{m}{81}$
21. $\frac{2}{9} = \frac{6}{k}$
22. $\frac{h}{35} = \frac{3}{7}$
23. $\frac{3}{16} = \frac{u}{40}$
24. $\frac{6}{a} = \frac{1}{3}$
25. $\frac{e}{9.5} = \frac{6.4}{7.6}$
26. $\frac{2.7}{3.0} = \frac{3.6}{x}$
27. $\frac{1.68}{w} = \frac{7}{12}$

NAME _____ DATE _____ PERIOD _____

6-5 Practice

Solving Proportions

Determine whether each pair of ratios forms a proportion.

1. $\frac{5}{8}, \frac{20}{32}$
2. $\frac{12}{28}, \frac{27}{63}$
3. $\frac{8}{50}, \frac{1}{43}$
4. $\frac{40}{48}, \frac{56}{42}$
5. $\frac{6.4}{16}, \frac{32}{80}$
6. $\frac{12}{18}, \frac{90}{135}$
7. $\frac{21}{24}, \frac{56}{64}$
8. $\frac{9}{16}, \frac{3}{4}$
9. $\frac{12}{32}, \frac{8}{3}$
10. $\frac{2.6}{4}, \frac{4.6}{8}$
11. $\frac{5.1}{1.7}, \frac{7.5}{2.5}$
12. $\frac{8.5}{25}, \frac{17}{50}$

ALGEBRA Solve each proportion.

13. $\frac{n}{12} = \frac{6}{18}$
14. $\frac{8}{v} = \frac{56}{105}$
15. $\frac{15}{35} = \frac{s}{7}$
16. $\frac{24}{30} = \frac{8}{w}$
17. $\frac{c}{28} = \frac{5}{7}$
18. $\frac{3}{r} = \frac{39}{65}$
19. $\frac{9}{15} = \frac{m}{25}$
20. $\frac{7.5}{6.0} = \frac{3.6}{x}$
21. $\frac{12}{25} = \frac{u}{40}$
22. $\frac{1}{a} = \frac{33}{132}$
23. $\frac{f}{5} = \frac{16}{40}$
24. $\frac{r}{6.5} = \frac{0.2}{1.3}$
25. $\frac{30}{14} = \frac{k}{1.54}$
26. $\frac{3.5}{7.2} = \frac{k}{57.6}$
27. $\frac{2.1}{42} = \frac{7}{t}$

28. **FOOD** Gayle is making fruit punch that consists of 2 quarts of juice and 1 quart of soda water. How much soda water does she need if she has 5 quarts of juice?

NAME _____ DATE _____ PERIOD _____

6-6 Skills Practice

Scale Drawings and Models

On a set of architectural drawings for a new school building, the scale is $\frac{1}{4}$ inch = 2 feet. Find the missing lengths of the rooms.

	Room	Drawing Length	Actual Length
1.	Lobby		16 feet
2.	Principal's Office	1.25 inches	
3.	Library		20 feet
4.	School Room	3 inches	
5.	Science Lab	1.5 inches	
6.	Cafeteria		48 feet
7.	Music Room	4 inches	
8.	Gymnasium	13 inches	
9.	Auditorium		56 feet
10.	Teachers' Lounge	1.75 inches	

11. Refer to Exercises 1–10. What is the scale factor?

12. What is the scale factor if the scale is 10 inches = 1 foot?

13. STRUCTURES A barn is 40 feet wide by 100 feet long. Make a scale drawing of the barn that has a scale of $\frac{1}{2}$ inch = 10 feet.

14. MAPS On a map, the key indicates that 1 centimeter equals 3.5 meters. A road is shown on this map that runs for 30 centimeters. How long is this road?

NAME _____ DATE _____ PERIOD _____

6-6 Practice

Scale Drawings and Models

On a map, the scale is 5 centimeters = 2 kilometers. Find the missing distances.

	Location	Map Distance	Actual Distance
1.	Town A to Town B	10 cm	
2.	Town A to Town C		10 km
3.	Town A to Town D		5.6 km
4.	Town A to Town E	2 cm	
5.	Town A to Town F	0.5 cm	
6.	Town A to Town G		3.2 km
7.	Town A to Town H	0.25 cm	
8.	Town A to Town I		2.4 km
9.	Town A to Town J		0.04 km
10.	Town A to Town K	1 cm	
11.	Town A to Town L	2.5 cm	
12.	Town A to Town M		0.48 km

13. Refer to Exercises 1–12. What is the scale factor?

14. What is the scale factor if the scale is 15 inches = 1 yard?

15. **STRUCTURES** A barn is 50 feet wide by 80 feet long. Make a scale drawing of the barn that has a scale of $\frac{1}{2}$ inch = 10 feet.

16. **PHOTOGRAPHY** A man in a photograph is 1.5 inches in height. If the man is 6 feet tall, what is the scale?

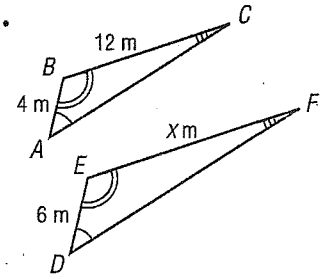
NAME _____ DATE _____ PERIOD _____

6-7 Practice

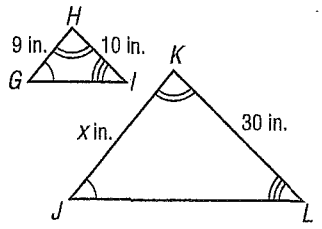
Similar Figures

In Exercises 1–8, the figures are similar. Find each missing measure.

1.



2.



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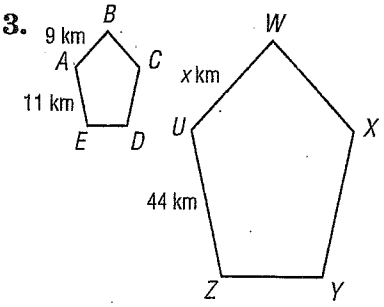
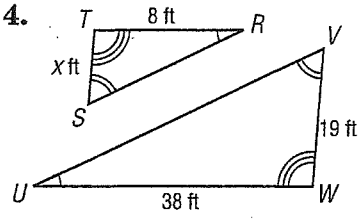
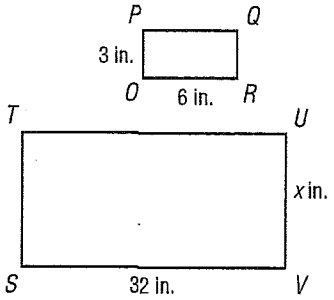


4.



5.



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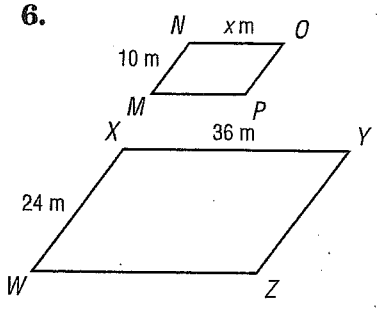

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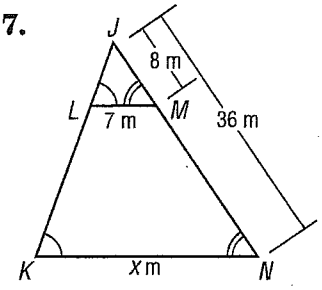
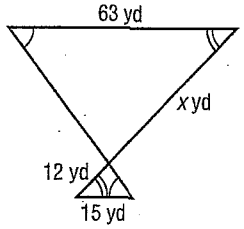


8.



9. GEOMETRY Triangle ABC is similar to triangle DEF. What is the value of $\overline{BC}$ if $\overline{EF}$ is 36 feet, $\overline{AC}$ is 7 feet, and $\overline{DF}$ is 28 feet?

10. GEOMETRY Quadrilateral $RSTU$ is similar to quadrilateral $LMNO$. What is the value of $\overline{LO}$ if $\overline{RU}$ is 6 inches, $\overline{LM}$ is 45 inches, and $\overline{RS}$ is 9 inches?

11. QUILTS A woman sews similar quilts for her daughter and her daughter's doll. If the daughter's quilt has a length of 2 yards and a width of 1 yard, and the doll's quilt has a length of $\frac{1}{2}$ yard, what is the width of the doll's quilt?

Lesson 6-7

NAME _____ DATE _____ PERIOD _____

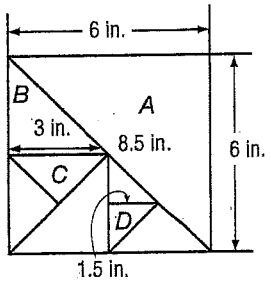
6-7 Word Problem Practice

Similar Figures

1. **PIZZA** Ralph's Pizza Shop sells two sizes of rectangular pizzas that are similar in shape. A large pizza is 12 inches by 18 inches. The shorter side of the small pizza is 6 inches. What is the perimeter of the small pizza?

2. **GEOMETRY** Triangle ABC is similar to triangle TUV. What is the value of $\overline{AC}$, if $\overline{TV}$ is 9 feet, $\overline{AB}$ is 36 feet, and $\overline{TU}$ is 4 feet?

3. **QUILTS** Jamie's mother is making a quilt. The block shown below is made from a series of similar triangles.



Find the lengths of the longest sides of triangles B, C, and D. Round to the nearest tenth.

4. **ART** Rio drew two similar rectangles. One rectangle was 9 inches long and 6 inches wide. The second rectangle was 15 inches wide. How long was the second rectangle?

5. **PERIMETER AND AREA** The front yard and back yard at the Jones' home are similar rectangles. The back yard is 20 feet by 30 feet. The longer dimension of the front yard is 20 feet.

   a. Find the scale factor of the two yards. What is the other dimension of the front yard?

   b. Find the perimeters of both yards. What is the scale factor of the perimeters?

   c. Find the areas of both yards. What is the scale factor of the areas?

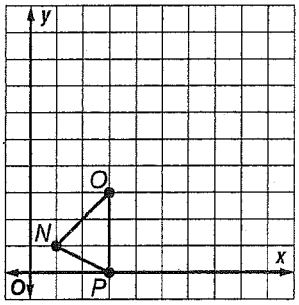
NAME _____ DATE _____ PERIOD _____

6-8 Practice

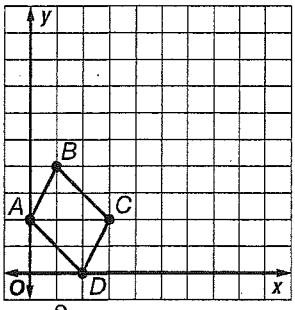
Dilations

Find the vertices of each figure after a dilation with the given scale factor k. Then graph the image.

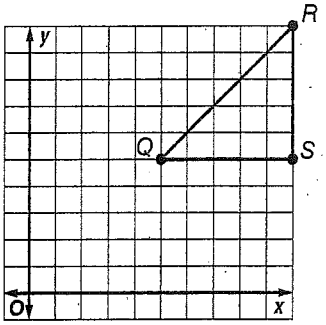
1. $k = 3$



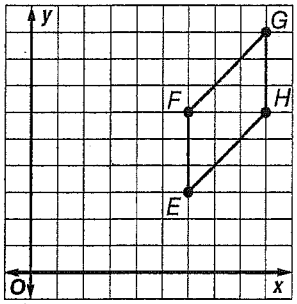
2. $k = 2.5$



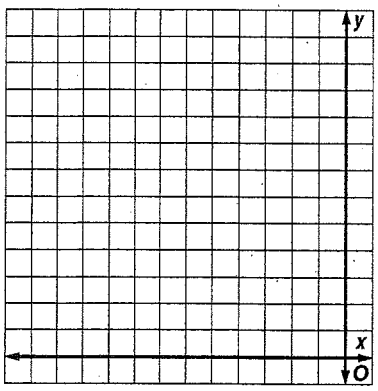
3. $k = \frac{1}{5}$



4. $k = \frac{2}{3}$



5. Find the vertices of figure $STUV$ after a dilation with a scale factor of 1.5 if it has vertices $S(-4, 1)$, $T(-4, 6)$, $U(-2, 8)$, and $V(-2, 3)$. Then graph the image.



6. PHOTOS Jordan has a photo of a lion that is 4 inches by 6 inches. He wants to sketch a larger version of the photo on paper that is 14 inches by 21 inches. What is the scale factor of the dilation?

7. IMAGES Mrs. Williamson is projecting a slide on the wall. The image on the slide is 1.25 inches by 1.5 inches. The image projected on the wall is 20 inches by 24 inches. What is the scale factor of the dilation?

Lesson 6-8

NAME _____ DATE _____ PERIOD _____

6-8 Word Problem Practice

Dilations

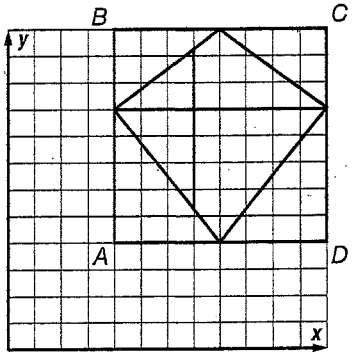
1. **GEOMETRY** A parallelogram has vertices at $A(-8, 5)$, $B(10, 3)$, $C(1, -5)$, and $D(-4, -3)$. Find the coordinates of the figure after a dilation with a scale factor of 0.5.

2. **PENNANTS** Linda is sketching a triangular pennant on a piece of grid paper. The triangle's vertices are located at (1, 3), (1, 15), and (16, 9). Once she got the sketch the way she wanted, she drew a larger copy. Find the coordinates of the triangle after a dilation with a scale factor of 3.

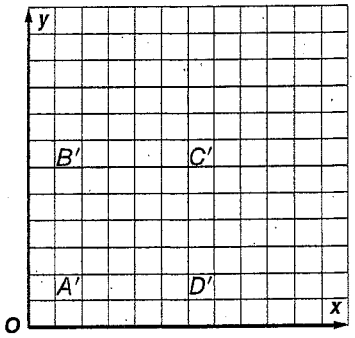
3. **PHOTOS** Rita enlarged a picture on a photocopier. The original photo was 3.5 by 5 inches. The copy was 8.75 by 12.5 inches. What is the scale factor of the dilation?

4. **STAMPS** Mike had a photo made into a postage stamp. The photo was 7 by 9.5 inches and the stamp was 1.4 by 1.9 inches. What is the scale factor of the dilation?

5. **ADVERTISING** An ad agency designed a logo for a company. The logo is shown below. Each square on the grid represents 1 square inch.



a. The company wants to create a smaller version of the logo to use on their letterhead. Graph the dilation of the logo with a scale factor of $\frac{1}{2}$.



b. The company wants to enlarge the logo for t-shirts. What would the coordinates of the vertices of the outer edge of the figure be after a dilation with a scale factor of 1.5?

c. The company wants to produce a large version of the logo to put over their company headquarters. The logo will be 6 feet wide. What is the scale factor of the dilation?