NAME Key DATE ______ SCORE ______

Practice 25

Ratio, Proportion, and Similarity

Lessons 7-1 through 7-3

Express each ratio in simplest form.

1. $\frac{20}{45}$ 4/9

2. 8 cm to 2 m 4 to 25

8 cm to 200 m

3. $\frac{2m}{7mn}$ 2/7n

4. $\frac{15n^2}{40n}$ 3n/8

5. $(x - 5):3(x - 5)$ 1:3

6. $\frac{2(a+7)}{6a+42}$ 1/3

$\frac{2(a+7)}{6(a+7)}$

Complete each statement.

7. If $\frac{a}{6} = \frac{4}{7}$, then $7a =$ 24.

8. If $\frac{b}{c} = \frac{d}{e}$, then $\frac{e}{d} =$ c/b.

9. If $\frac{x}{7} = \frac{c}{9}$, then $\frac{x}{c} =$ 7/9.

10. If $5:x = 9:3$, then $9x =$ 15.

11. If $\frac{a}{8} = \frac{b}{12}$, then $\frac{a+8}{8} =$ $\frac{b+12}{12}$.

12. If $\frac{x}{5} = \frac{3}{4}$, then $\frac{x+3}{9} =$ 3/4.

Find the value of x.

13. $\frac{x}{20} = \frac{3}{5}, x =$ 12

14. $\frac{7}{2} = \frac{3x}{5}, x =$ 35/6

15. $\frac{x-2}{3} = \frac{1}{4}, x =$ 11/4

$3 = 4x - 8$

16. $\frac{x-4}{x+4} = \frac{1}{3}, x =$ 8

$3x - 12 = x + 4$

17. $\frac{4}{2x-5} = \frac{3}{x+7}, x =$ 43/2

$4x + 28 = 6x - 15$
$43 = 2x$

18. $\frac{x}{x-2} = \frac{x+5}{x}, x =$ 10/3

$x^2 = x^2 + 3x - 10$
$10 = 3x$

19. The measures of two supplementary angles are in the ratio 5:13. Find the measure of each angle.

$5x + 13x = 180$
$x = 10$

smaller angle 50 larger angle 130

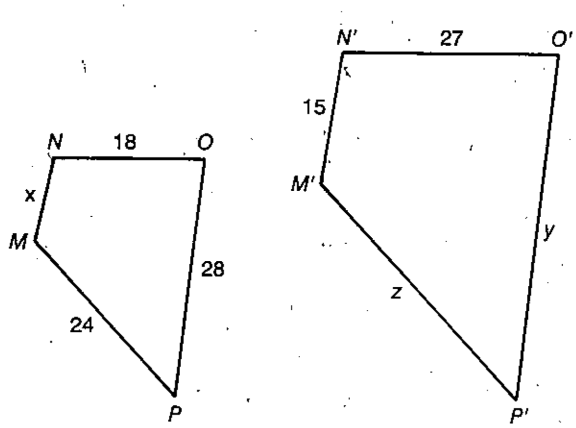
20. Quad. $MNOP \sim$ quad. $M'N'O'P'$.

a. The scale factor of quad. $MNOP$ to quad $M'N'O'P'$ is $\frac{18}{27} = \frac{2}{3}$.

b. The value of $x =$ 10. $\frac{18}{27} = \frac{x}{15}$

c. The value of $y =$ 42. $\frac{2}{3} = \frac{28}{y}$

d. The value of $z =$ 36. $\frac{2}{3} = \frac{24}{z}$



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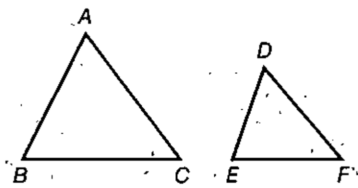
Practice 26
Supplementary Practice

Lessons 7-4 through 7-5

Using the given information, tell which triangles are similar. (The diagram is *not* drawn to scale.)

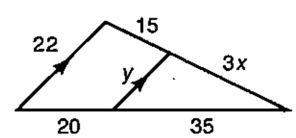


1. $\frac{AB}{DF} = \frac{AC}{DE}$; $\angle A \cong \angle D$ $\triangle ABC \sim \triangle DFE$
2. $\frac{AB}{FD} = \frac{BC}{DE} = \frac{AC}{FE}$ $\triangle ABC \sim \triangle FDE$
3. $\angle A \cong \angle E$; $\angle B \cong \angle F$ $\triangle ABC \sim \triangle EFD$
4. $AB = AC$; $DE = DF$; $\angle A \cong \angle D$ $\triangle ABC \sim \triangle DEF$ $\triangle ABC \sim \triangle DFE$

Complete each statement with the word *always*, *sometimes*, or *never*.

5. Two equilateral triangles are always similar.
6. Two similar triangles are sometimes congruent.
7. Two congruent triangles are always similar.
8. Two isosceles right triangles are always similar.

9. Find the values of x and y. Refer to the figure.

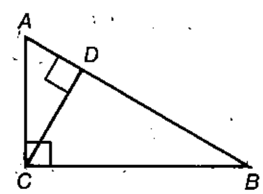


$x =$ 8.75 $\qquad \frac{15}{20} = \frac{3x}{35}$

$y =$ 14 $\qquad \frac{35}{55} = \frac{y}{22}$

10. Given: $\triangle ABC$ with $m\angle ACB = 90$; $\overline{CD} \perp \overline{AB}$

Prove: $AB \cdot AD = (AC)^2$



1. $m\angle ACB = 90$; $\overline{CD} \perp \overline{AB}$	1. Given
2. $\angle ACB$ is rt. $\angle$	2. def. rt. $\angle$
3. $\angle ADC$ is rt. $\angle$	3. def. $\perp$
4. $\angle ACB \cong \angle ADC$	4. all rt. $\angle$s $\cong$
5. $\triangle ACB \sim \triangle ADC$	5. AA $\sim$ Post.
6. $\frac{AB}{AC} = \frac{AC}{AD}$	6. corr. sides $\sim \triangle$ prop.
7. $AB \cdot AD = (AC)^2$	7. Means - Extremes
4b. $\angle A \cong \angle A$	4b. Refl.

RESOURCE BOOK for GEOMETRY

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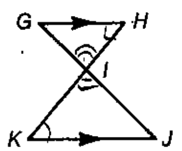
Practice 27
Working with Similar Triangles

Lessons 7-4 through 7-6

Can the two triangles be proved similar? If so, state the similarity and tell which postulate or theorem you would use. If not, write *no*.

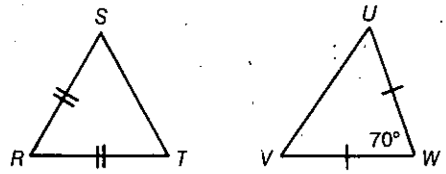
1.



$\triangle IHG \sim \triangle IKJ$

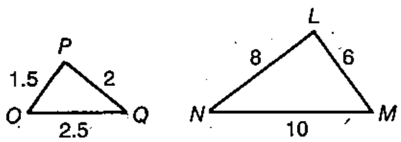
AA

2.



OO

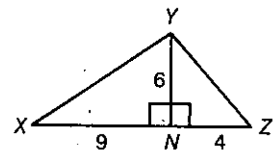
3.



$\triangle OPQ \sim \triangle MLN$ $\quad \frac{1.5}{6} = \frac{2}{8} = \frac{2.5}{10}$

SSS ~ Th.

4.



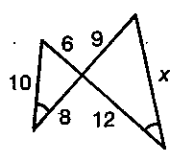
$\frac{4}{6} = \frac{6}{9}$

$\triangle NZY \sim \triangle NYX$

SAS ~ Th.

Find the value of x.

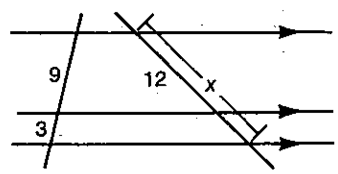
5.



$\frac{6}{9} = \frac{10}{x}$

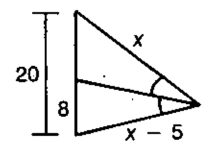
$x =$ 15

6.



$x =$ 16 $\quad \frac{9}{12} = \frac{12}{x}$

7.



$\frac{8}{20} = \frac{x-5}{2x-5}$

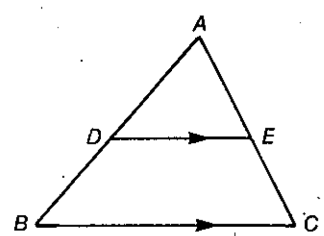
$16x - 40 = 20x - 100$

$60 = 4x$

$x =$ 15

Complete the table. It may help to draw a new sketch for each exercise and label lengths as you find them.

	AD	DB	AB	AE	EC	AC	DE	BC
8.	8	16	24	6	12	18	10	30
9.	7	7	14	5	5	10	11	22
10.	4	6	10	6	9	15	9	22.5



Exs. 8–10

11. To estimate the height of a tree, Adele waited until the tops of the shadows of the tree and a sign coincided. The sign is 2 m high and the sign and the tree have shadows of 6.4 m and 15.8 m, respectively. Find the height of the tree rounded to the nearest tenth of a meter. 4.9

$\frac{2}{6.4} = \frac{x}{15.8}$