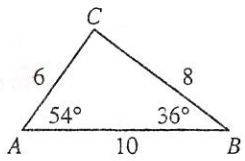
NAME Key DATE _____ SCORE _____

Ratio and Proportion

For use after Section 7–2

Use the diagram to find the value of each ratio in simplest form.

1. $AC : BC$ 3:4
2. $AB : BC$ 5:4
3. $m\angle B : m\angle A$ 2:3
4. $m\angle C : m\angle B$ 5:2



Exs. 1–4

In Exercises 5–10, $e = 6$, $f = 15$, and $g = 30$. Write each ratio in simplest form.

5. e to g 1 to 5
6. f to e 5 to 2
7. $\frac{g-e}{f}$ $\frac{8}{5}$
8. $\frac{e}{f+g}$ $\frac{2}{15}$
9. $e : f : g$ 2:5:10
10. $g : (e+f) : (e+f+g)$ 10:7:17

Exercises 11–12 refer to a triangle. Express the ratio of the height to the base in simplest form.

11. height 6 cm; base 8 cm $\frac{3}{4}$
12. height 150 cm; base 1.2 m $\frac{5}{4}$

Complete each statement.

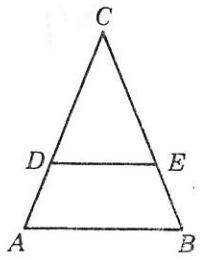
13. If $b : 8 = 2 : 7$, then $7b =$ 16.
14. If $\frac{e}{3} = \frac{f}{4}$, then $\frac{e}{f} =$ $\frac{3}{4}$.
15. If $\frac{2-y}{y} = \frac{6}{4}$, then $\frac{2}{y} =$ $\frac{10}{4}$.
16. If $\frac{x+2}{8} = \frac{5}{10}$, then $\frac{x+7}{18} =$ $\frac{x+2}{8}$ or $\frac{5}{10}$.

Find the value of x.

17. $\frac{x}{3} = \frac{5}{7}$ $2\frac{1}{7}$
18. $\frac{20}{x} = \frac{5}{12}$ 48
19. $\frac{x+2}{4} = \frac{9}{2}$ 16

For the figure shown it is given that $\frac{CD}{CA} = \frac{DE}{AB}$.

20. If $CD = 6$, $CA = 9$, and $DE = 18$, then $AB =$ 27.
21. If $CA = 60$, $CD = 40$, and $AB = 20$, then $DE =$ $13\frac{1}{3}$.
22. If $DE = 24$, $AB = 54$, and $CD = 12$, then $CA =$ 27.
23. If $CD = 4$, $CA = 10$, and $AB = 40$, then $DE =$ 16.
24. If $CA = 30$, $CD = 12$, and $AB = 45$, then $DE =$ 18.
25. If $DE = 14$, $AB = 21$, and $AC = 27$, then $CD =$ 18.
26. If $AB = 25$, $DE = 15$, and $CD = 9$, then $CA =$ 15.



Exs. 20–26

NAME key DATE _____ SCORE _____

Similar Polygons

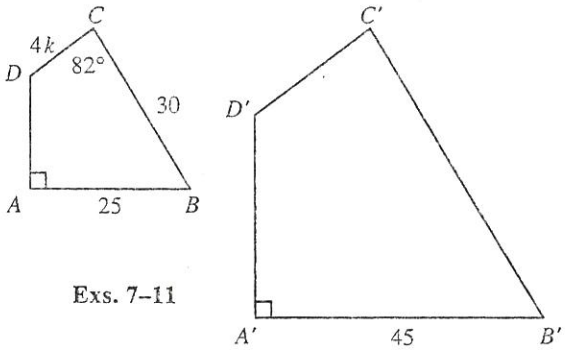
For use after Section 7–3

Tell whether the polygons are *always*, *sometimes*, or *never* similar.

1. Two triangles SOMETIMES
2. Two congruent pentagons ALWAYS
3. Two regular octagons ALWAYS
4. A rectangle and a square SOMETIMES
5. A right triangle and an isosceles triangle SOMETIMES
6. A parallelogram and a trapezoid NEVER

In Exercises 7–11 quad. $ABCD \sim$ quad. $A'B'C'D'$.

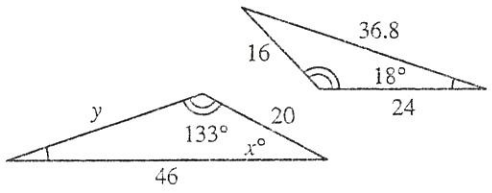
7. What is the scale factor of quad. $ABCD$ to quad. $A'B'C'D'$? 5:9
8. Find $m\angle C'$. 82
9. Find $B'C'$. 54
10. Find $D'C'$ in terms of k. $\frac{36k}{5}$
11. Find the ratio of the perimeters. 5:9



Exs. 7–11

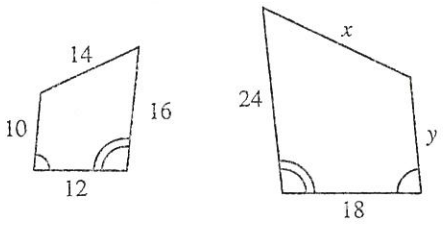
Two similar polygons are shown. Find the values of x and y.

12.



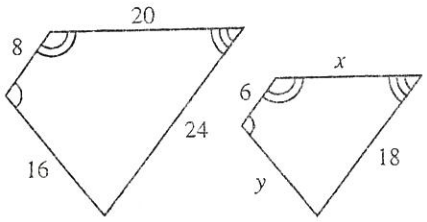
$x =$ 29 ; $y =$ 30

13.



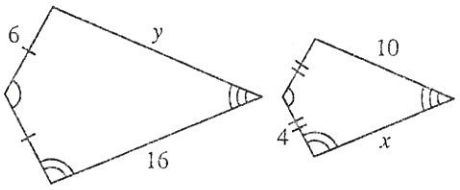
$x =$ 21 ; $y =$ 15

14.



$x =$ 15 ; $y =$ 12

15.



$x =$ $10\frac{2}{3}$; $y =$ 15

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A Postulate for Similar Triangles

For use after Section 7-4

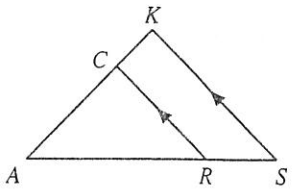
Refer to the diagram and complete.

1. $\triangle CAR \sim \triangle$ KAS

2. $\frac{CR}{KS} = \frac{?}{AK}$ AC

3. $\angle S \cong \angle$ ARC

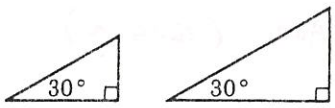
4. $\frac{SK}{RC} = \frac{AS}{?}$ AR



Exs. 1–4

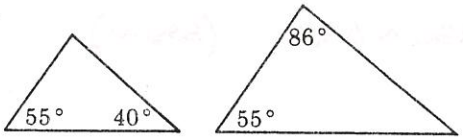
Tell whether the triangles are similar or not similar.

5.



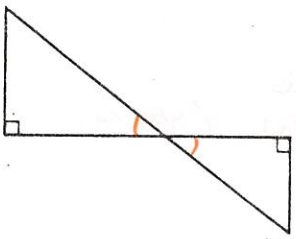
SIMILAR (AA)

6.



NOT SIMILAR

7.

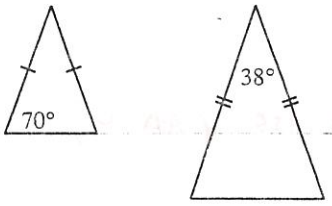


SIMILAR (AA)

8.

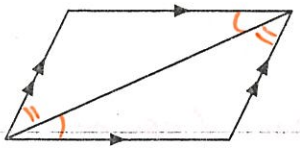
SIMILAR (AA)

9.



NOT SIMILAR

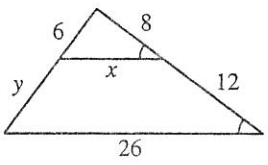
10.



SIMILAR (AA)

Similar triangles are shown. Find the values of x and y.

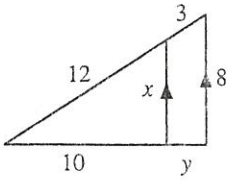
11.



$x =$ 10.4

$y =$ 9

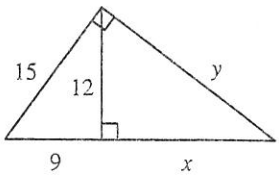
12.



$x =$ 6.4

$y =$ 2.5

13.



$x =$ 16

$y =$ 20

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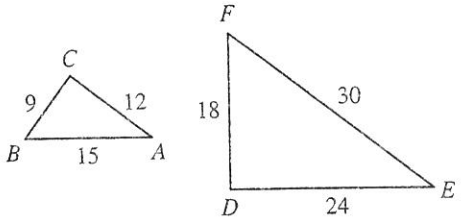
Theorems for Similar Triangles

For use after Section 7-5

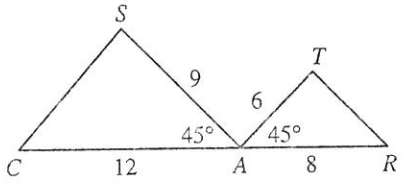
In Exercises 1–6 name two similar triangles. Also name the theorem or postulate that justifies your answer.

1.



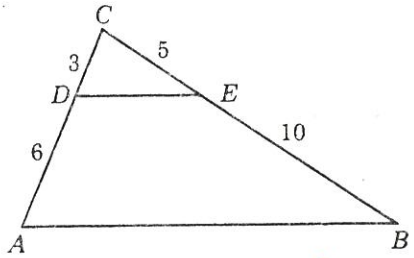
$\triangle ABC \sim \triangle EFD$ (SSS ~)

2.



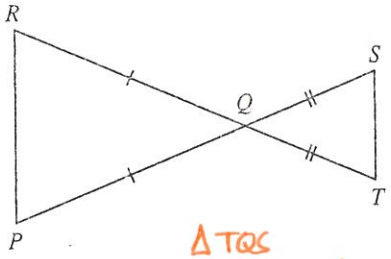
$\triangle ACS \sim \triangle ART$ (SAS ~)

3.



$\triangle ABC \sim \triangle DEC$ (SAS ~)

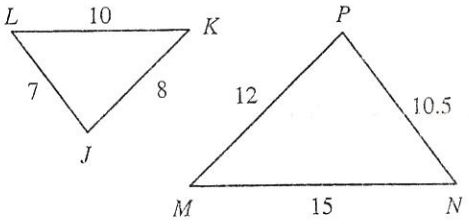
4.



$\triangle TQS$

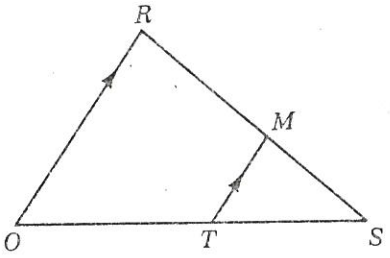
$\triangle PQR \sim \triangle SQT$ (SAS ~)

5.



$\triangle JKL \sim \triangle PMN$ (SSS ~)

6.



$\triangle ROC \sim \triangle MTS$ (AA ~)

The lengths of the sides of $\triangle RED$ and $\triangle SUN$ are given.

7. $RE = 6$, $ED = 8$, $RD = 9$, $SU = 15$, $UN = 20$, $SN = 22.5$

   Are the triangles similar? YES

8. $RE = 6$, $ED = 7$, $RD = 8$, $SU = 24$, $UN = 21$, $SN = 18$

   a. Complete: $\triangle RED \sim \triangle$ SNU

   b. What is the scale factor? 1:3

9. $RE = 12$, $ED = 16$, $RD = 20$, $SU = 10$, $UN = 24$, $SN = 26$

   Are the triangles similar? No

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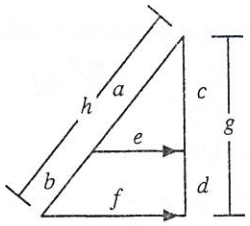
Proportional Lengths

For use after Section 7-6

Tell whether the proportion is correct. Write *Yes* or *No*.

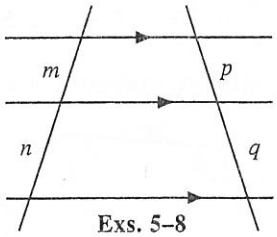
1. $\frac{e}{f} = \frac{a}{h}$ YES
2. $\frac{e}{f} = \frac{c}{d}$ No
3. $\frac{b}{a} = \frac{d}{c}$ YES
4. $\frac{b}{h} = \frac{c}{g}$ No



Exs. 1–4

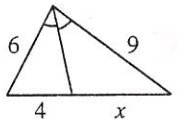
Tell whether the proportion is correct. Write *Yes* or *No*.

5. $\frac{m}{n} = \frac{q}{p}$ No
6. $\frac{p}{q} = \frac{m}{n}$ YES
7. $\frac{q}{p} = \frac{n}{m}$ YES
8. $\frac{m}{q} = \frac{p}{n}$ No

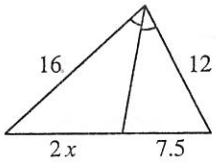


Exs. 5–8

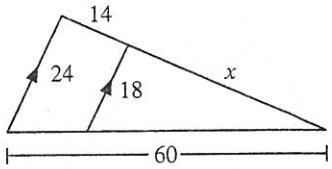
Find the value of x.

9. 

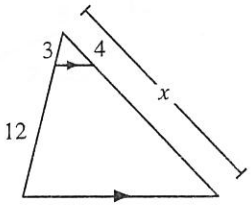
$x =$ 6

10. 

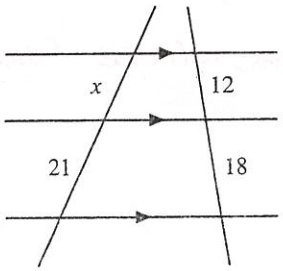
$x =$ 5

11. 

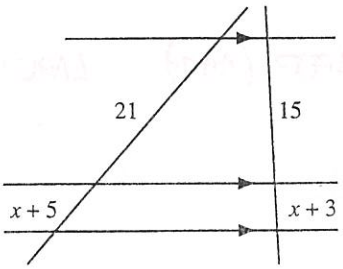
$x =$ 42

12. 

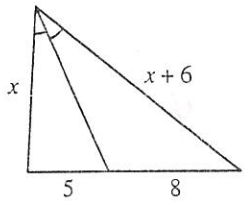
$x =$ 20

13. 

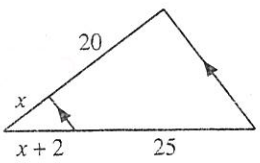
$x =$ 14

14. 

$x =$ 2

15. 

$x =$ 10

16. 

$x =$ 8

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Similar Polygons

For use after Chapter 7

Write the algebraic ratio in simplest form.

1. $\frac{6x^2y}{24xy^2}$ $\frac{x}{4y}$

2. $\frac{a(x-2)}{5(x-2)}$ $\frac{a}{5}$

3. $\frac{x+6}{4x+24}$ $\frac{1}{4}$

Complete.

4. If $\frac{x}{2} = \frac{4}{5}$, then $5x =$ 8.

5. If $\frac{x}{y} = \frac{4}{5}$, then $\frac{y}{x} =$ $\frac{5}{4}$.

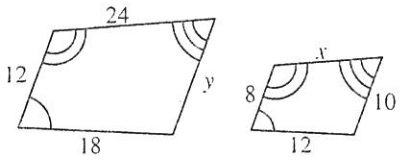
Find the value of x.

6. $\frac{x}{5} = \frac{16}{20}$ $x =$ 4

7. $\frac{x-3}{4} = \frac{9}{8}$ $x =$ $\frac{15}{2}$

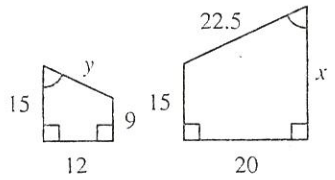
Two similar polygons are shown. Find the values of x and y.

8.



$x =$ 16; $y =$ 15

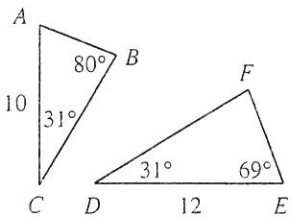
9.



$x =$ 25; $y =$ 13.5

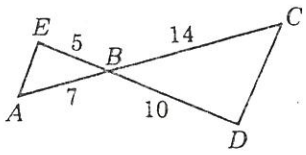
Name two similar triangles. Also name the theorem or postulate that justifies your answer.

10.



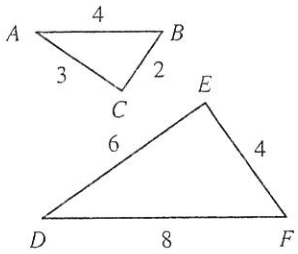
$\triangle ABC \sim \triangle EFD$ (AA~)

11.



$\triangle ABE \sim \triangle CBD$ (SAS~)

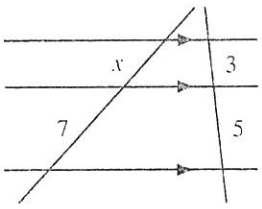
12.



$\triangle ABC \sim \triangle DFE$ (SSS~)

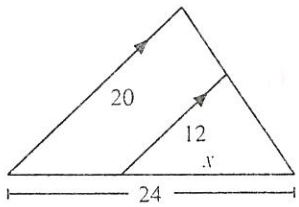
Find the value of x.

13.



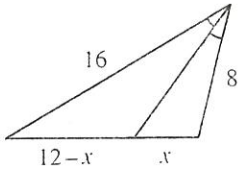
$x =$ 4.2

14.



$x =$ 14.4

15.



$x =$ 4