8.1-8.5 6 days  with 8.6 7 days  Key

# CHAPTER 8 – HOMEWORK AND PRACTICE

**Sections 8.1-8.2** Topic: Dilations / Similar Polygons Date: 1 Day

Hw: 8.1 PM A, Pg. 503 #18-21, *8.1 Std Test Prac, 8.2 PM A

Extra Practice: Pg. 503 #7-12, 22-24 / Pg. 512 #16-19, 24-30 (do not graph)

* Proportions & Similar Triangles *

**Sections 8.3** Topic: Similar Triangles Date: 1 Day

Hw: P&ST #11-16, 8.3 Practice, *8.3 Std Test Prac, *Mid-Chapter

Extra Practice: Pg. 520 #5-17

**Sections 8.4** Topic: Side-Splitting Thm Date: 1 Day

Hw: Pg. 528 #6-18 even & #25

Extra Practice: Pg. 528 #7-17 odd

If together
Hw: Pg. 528 #6-18 even & #25
-and-
Pg. 537 #8-16 even

**Sections 8.5** Topic: Similarity Theorems Date: 1 Day

Hw: Proportional Parts, 8.5 Practice, (optional) (Pg. 537 #8-16 even)

Extra Practice: Pg. 537 #9-17 odd

☆ **Sections 8.6** Topic: Area & Volume Ratios Date: 1 Day ☆

Hw:

Extra Practice:

Review: Ch. Assessment NOT 14-16 8.6 only 19,20 1 Day

# CHAPTER 8: VOCABULARY

**Dilation –**

**Scale factor –**

**Contraction –**

**Expansion –**

**Similar –**

**Proportional –**

**Similarity statement –**

NAME _____ CLASS _____ DATE _____

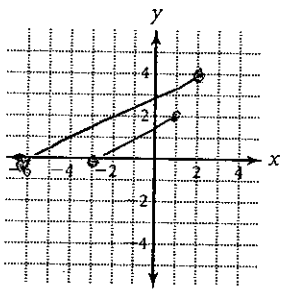
# Practice Masters Level A

## 8.1 Dilations and Scale Factors

**In Exercises 1–4, the endpoints of a line segment and a scale factor, $n$, are given. Use the dilation $D(x, y) = (nx, ny)$ to transform each segment, and plot the preimage and the image on the coordinate plane.**

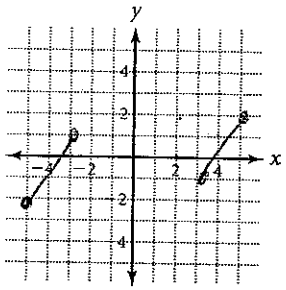
1. (1, 2) and (−3, 0)
   $n = 2$

(2,4)
(−6,0)



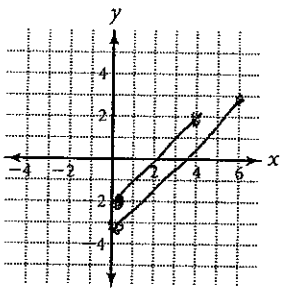
2. (5, 2) and (3, −1)
   $n = -1$

(−5,−2)
(−3,1)



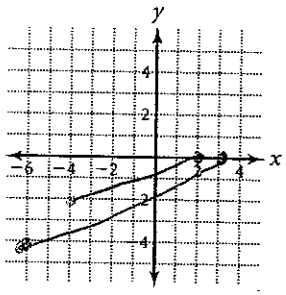
3. (6, 3) and (0, −3)
   $n = \frac{2}{3}$

(4,2)
(0,−2)



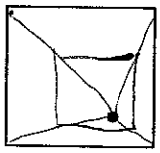
4. (−4, −2) and (2, 0)
   $n = \frac{3}{2}$

(−6,−3)
(3,0)

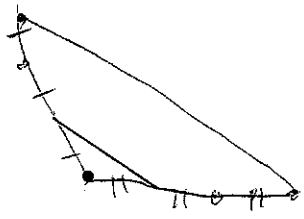


**In the space provided, draw the dilation of each figure, using the given scale factor, $n$, and the given point as a center.**

5. $n = \frac{1}{2}$



6. $n = 3$



NAME _____ CLASS _____ DATE _____

# Standardized Test Practice

## 8.1 Dilations and Scale Factors

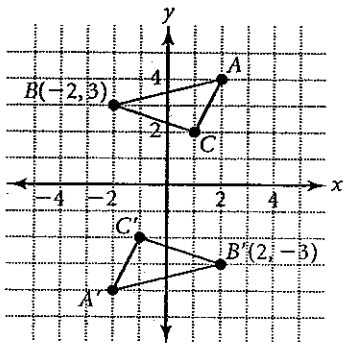
**TEST TAKING STRATEGY** Make an inference to fill in missing information.

1. ***Multiple Choice*** Which are the coordinates of the image of point $(4, -6)$ under the dilation $D(x, y) = (0.5x, 0.5y)$?

   (A) $(2, -3)$ (B) $(2, 3)$

   (C) $(8, 12)$ (D) $(8, -12)$

2. ***Multiple Choice*** Find the scale factor of the dilation below. $ABC$ is the preimage and $A'B'C'$ is the image.




   (A) 2 (B) 1

   (C) $-1$ (D) $-2$

3. ***Multiple Choice*** A line segment 6 inches long is transformed under a dilation with scale factor of 3. How long is the image?

   (A) 2 inches (B) 3 inches

   (C) 9 inches (D) 18 inches

4. ***Multiple Choice*** The image under a dilation of a 12-inch segment is 3 inches long. What is the scale factor of the dilation?

   (A) $\frac{1}{4}$ (B) $\frac{1}{3}$

   (C) 3 (D) 4

***Quantitative Comparison*** In Exercises 5–8, choose the letter of the statement below that is true about the quantities in Columns I and II.

A The number in Column I is greater.
B The number in Column II is greater.
C The two numbers are equal.
D The relationship cannot be determined from the given information.

| | Column I | Column II |
|---|---|---|
| 5. | scale factor of the dilation that transforms $A(-3, 5)$ to $A'(-12, 20)$ | scale factor of the dilation that transforms $A(-3, 5)$ to $A'(-9, 15)$ |
| | (A) (B) | (C) (D) |
| 6. | slope of the line through points $A(a, b)$ and $B(c, d)$ | slope of the line through points $A'(-2a, -2b)$ and $B'(-2c, -2d)$ |
| | (A) (B) | (C) (D) |
| 7. | length of a line segment under a dilation with scale factor 0.5 | length of a line segment under a dilation with scale factor 2 |
| | (A) (B) | (C) (D) |
| 8. | scale factor of the dilation that transforms $A(-2, 3)$ to $A'(4, -6)$ | scale factor of the dilation that transforms $A(-2, 3)$ to $A'(-4, 6)$ |
| | (A) (B) | (C) (D) |

9. ***Multiple Choice*** Which of the following are the coordinates of the image of point $(-1, 8)$ under the dilation $D(x, y) = (2x, -0.5y)$?

   (A) $(-2, 4)$ (B) $(-2, -4)$

   (C) $(2, 40)$ (D) $(-2, 40)$

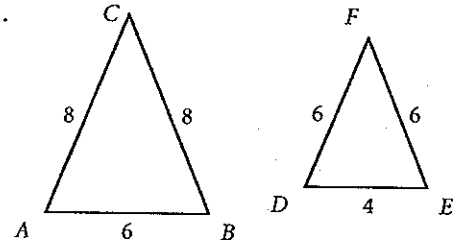
NAME _____ CLASS _____ DATE _____

# Practice Masters Level A

## 8.2 Similar Polygons

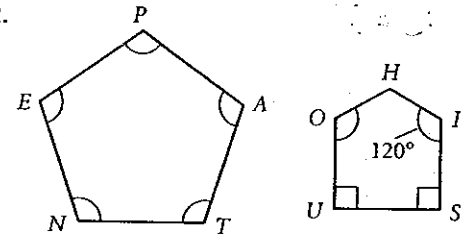
**In Exercises 1–4, determine whether the polygons are similar. Explain your reasoning. If the polygons are similar, write a similarity statement.**

1.



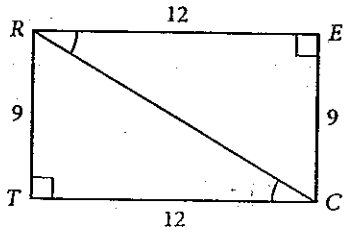

$\frac{8}{6} = \frac{4}{3}$ $\frac{6}{4} = \frac{2}{3}$ not similar

2.



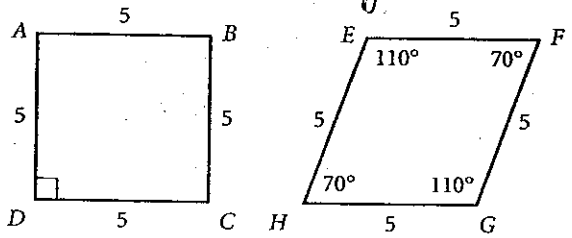

not similar shape or angles

3.




similar (congruent also) $\triangle RCT \sim \triangle ACE$ ☆ order matters

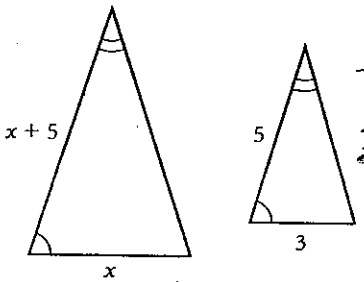
4.




no, angles/shape not similar

**In Exercises 5 and 6, the polygons in each pair are similar. Find *x*.**

5.




$\frac{x}{3} = \frac{x+5}{5}$

$3(x+5) = 5x$

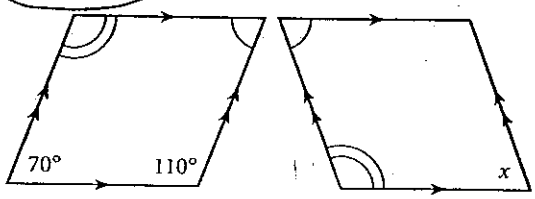
$3x + 15 = 5x$

$15 = 2x$

$x = 7.5$

$x = 7.5$

6.




70°

(across from single angle)

**Solve each proportion for *y*.**

7. $\frac{3y}{4.1} = \frac{6}{5}$

$5(3y) = 6(4.1)$

$15y = 24.6$

$y = 1.64$

8. $\frac{36}{y+2} = \frac{24}{y}$

$24y + 48 = 36y$

$12y = 48$

$y = 4$

Geometry - Mrs. Fucsko

Name_____

# Proportions & Similar Triangles

Date_____

**Solve each proportion.**

1) $\frac{k}{4}=\frac{9}{8}$ $8k=36$ $k=4.5$ or $\frac{9}{2}$

2) $\frac{6}{p}=\frac{7}{5}$ $30=7p$ $p=\frac{30}{7}$ or $4.29$

3) $\frac{10}{5}=\frac{x}{2}$ $20=5x$ $x=4$

4) $\frac{5}{10}=\frac{n}{6}$ $30=10n$ $n=3$

5) $\frac{3}{6}=\frac{n+4}{8}$ $24=6n+24$ $0=6n$ $0=n$

6) $\frac{5}{9}=\frac{8}{b-3}$ $5b-15=72$ $5b=87$ $b=\frac{87}{5}$ or $17.4$

7) $\frac{9}{4}=\frac{v-4}{2}$ $18=4v-16$ $34=4v$ $\frac{17}{2}=v$ or $8.5$

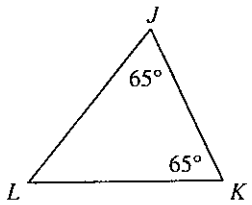
8) $\frac{2}{n}=\frac{5}{n-10}$ $2n-20=5n$ $-20=3n$ $-\frac{20}{3}=n$ or $6.67$

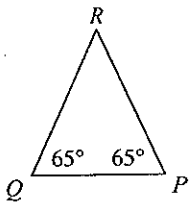
9) $\frac{8}{7}=\frac{x-3}{x}$ $8x=7x-21$ $x=-21$

10) $\frac{a}{8}=\frac{a-4}{10}$ $10a=8a-32$ $2a=-32$ $a=-16$

**State if the triangles in each pair are similar. If so, state how you know they are similar and complete the similarity statement.**

11)

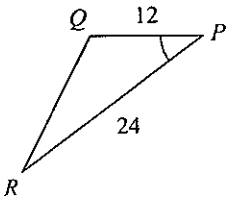


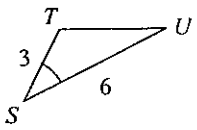

AA

$\Delta JKL \sim$ ΔPQR or ΔQPR

12)




$\frac{12}{3} = 4$

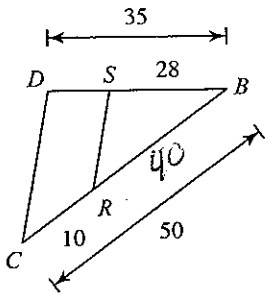



$\frac{24}{6} = 4$

SAS

$\Delta PQR \sim$ ΔSTU

13)



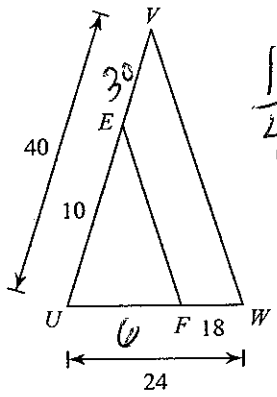

$\frac{28}{35} = \frac{4}{5}$

$\frac{40}{50} = \frac{4}{5}$

SAS

$\Delta BCD \sim$ ΔBRS

14)



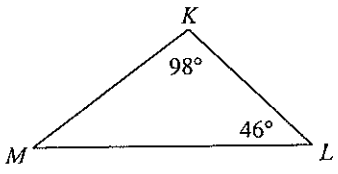

$\frac{10}{40} = \frac{1}{4}$

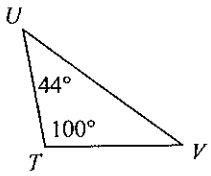
$\frac{6}{24} = \frac{1}{4}$

SAS

$\Delta UVW \sim$ ΔUEF

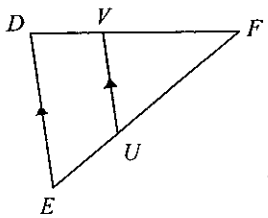
15)




$\Delta KLM \sim$ not similar

16)




AA

$\Delta FED \sim$ ΔFUV

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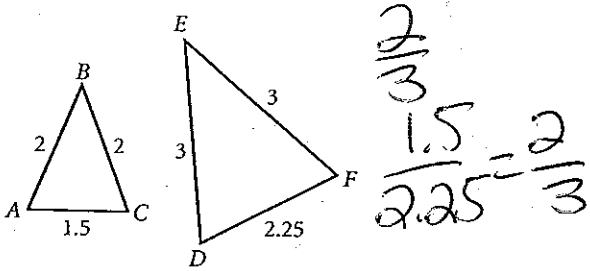
# Practice

## 8.3 *Triangle Similarity*

**Determine whether each pair of triangles can be proven similar by using AA, SSS, or SAS. If so, write a similarity statement, and identify the postulate or theorem used.**

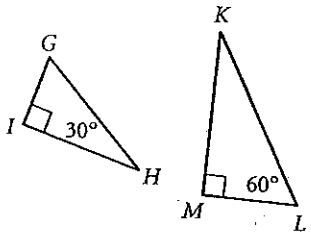
1.




$\frac{2}{3}$ $\frac{1.5}{2.25} = \frac{2}{3}$

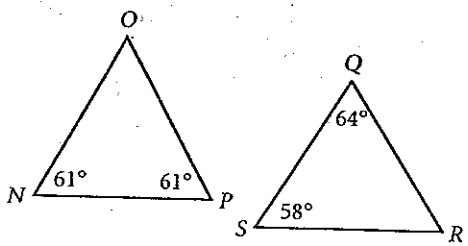
SSS, $\triangle ABC \sim \triangle DEF$

2.



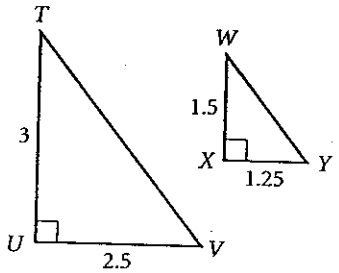

AA, $\triangle GIH \sim \triangle LMK$

3.




not similar

4.

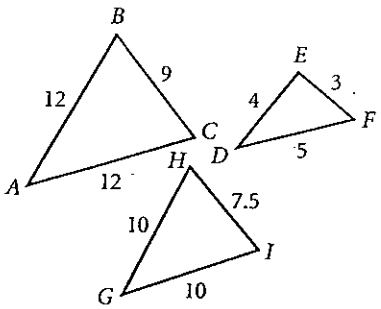



$\frac{1.5}{3}$ $\frac{1.25}{2.5}$

SAS, $\triangle TUV \sim \triangle WXY$

**In Exercises 5 and 6, indicate which figures are similar. Explain your reasoning.**

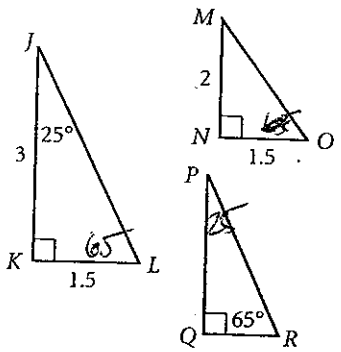
5.




$\triangle ABC \sim \triangle GHI$

SSS

6.




$\triangle JKL \sim \triangle PQR$

AA

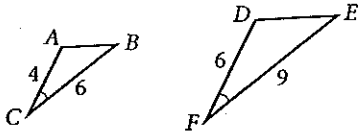
NAME _____ CLASS _____ DATE _____

# Standardized Test Practice

## 8.3 Triangle Similarity Postulates

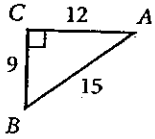
**TEST TAKING STRATEGY** Look carefully at all possible answers before choosing one.

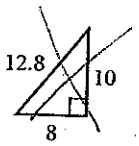
1. ***Multiple Choice*** Which statement is true about the triangles?

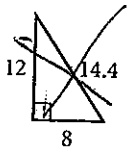


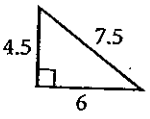

(A) $\triangle ABC \sim \triangle DEF$ by AA.
(B) $\triangle ABC \sim \triangle DEF$ by SSS.
(C) $\triangle ABC \sim \triangle DEF$ by SAS.
(D) The triangles can not be proven similar.

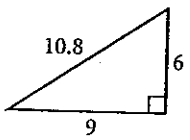
2. ***Multiple Choice*** Which triangle is similar to $\triangle ABC$?



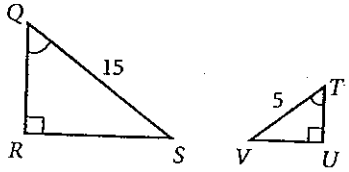

(A) 


(B) 


(C) 


(D) 


3. ***Multiple Choice*** Which of the following statements is true about the triangles below?



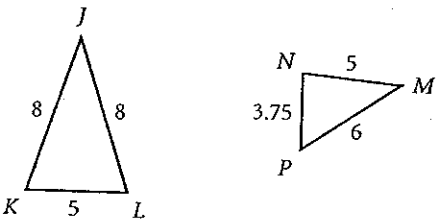

(A) $\triangle QRS \sim \triangle TUV$ by AA.
(B) $\triangle QRS \sim \triangle TUV$ by SSS.
(C) $\triangle QRS \sim \triangle TUV$ by SAS.
(D) The triangles can not be proven similar.

***Quantitative Comparison*** In Exercises 4–5, choose the letter of the statement below that is true about the quantities in Columns I and II.

A The number in Column I is greater.
B The number in Column II is greater.
C The two numbers are equal.
D The relationship cannot be determined from the given information.

| | Column I | Column II |
|---|---|---|
| 4. | $m\angle L$ if $\triangle JKL \sim \triangle QRS$, $m\angle J = 90°$, and $m\angle K = 54°$ | $m\angle R$ if $\triangle JKL \sim \triangle QRS$, $m\angle J = 90°$, and $m\angle K = 54°$ |
| | (A) | (C) (D) |
| 5. | $\frac{AB}{DE}$ if $\triangle ABC \sim \triangle DEF$ | $\frac{CB}{FE}$ if $\triangle ABC \sim \triangle DEF$ |
| | (A) (B) | (C) |

6. ***Multiple Choice*** Which of the following statements is true about the triangles below?




(A) $\triangle JKL \sim \triangle MNP$ by AA.
(B) $\triangle JKL \sim \triangle MNP$ by SSS.
(C) $\triangle JKL \sim \triangle MNP$ by SAS.
(D) The triangles can not be proven similar.

NAME _____ CLASS _____ DATE _____

# Mid-Chapter Assessment

## *Chapter 8 (Lessons 8.1–8.3)*

**Write the letter that best answers the question or completes the statement.**

D 1. The point $(-3, 2)$ is transformed by a dilation with a scale factor of 3. What are the coordinates of the image?

a. $(3, -2)$ b. $(2, -3)$ c. $(9, -6)$ d. $(-9, 6)$

A 2. The point $(8, -12)$ is transformed to the point $(-2, 3)$. What is the scale factor of the dilation?

a. $-\frac{1}{4}$ b. $\frac{1}{2}$ c. $-2$ d. 4

B 3. If $\frac{p}{q} = \frac{r}{s}$, which of the following is true? (Assume that $p$, $q$, $r$, and $s \neq 0$.)

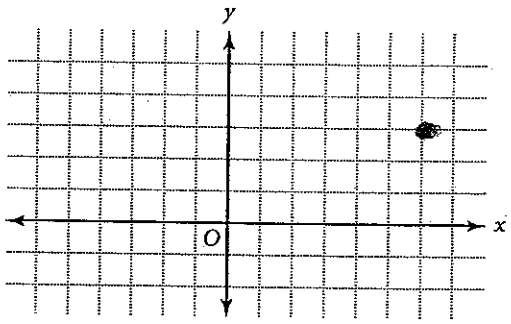
a. $\frac{r}{q} = \frac{p}{s}$ b. $\frac{p}{r} = \frac{q}{s}$ c. $\frac{p}{s} = \frac{r}{q}$ d. $\frac{s}{q} = \frac{p}{r}$

A 4. If $\triangle ABC \sim \triangle XYZ$, which of the following is true?

a. $\frac{AB}{XY} = \frac{BC}{YZ}$ b. $\frac{AC}{XY} = \frac{BC}{YZ}$ c. $\frac{BC}{XY} = \frac{AB}{YZ}$ d. $\frac{AC}{XZ} = \frac{BC}{XY}$

5. Plot the image of $P(2, 1)$ after a dilation with a scale factor of 3.

(6, 3)



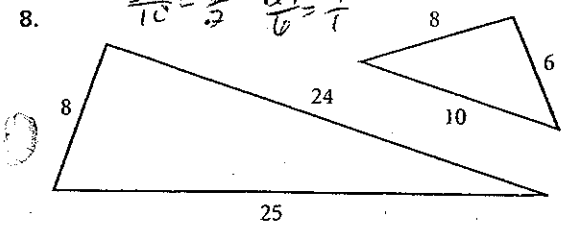

**Solve each proportion for *x*.**

6. $\frac{6}{15} = \frac{8}{x}$ $6x = 120$ $x = 20$

7. $\frac{4}{x+2} = \frac{7}{21}$ $7x + 14 = 84$ $7x = 70$ $x = 10$

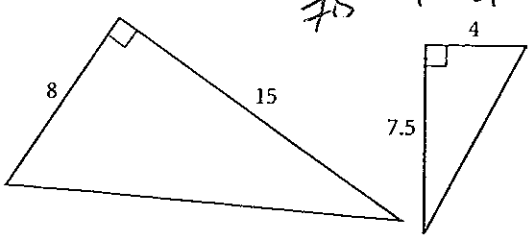
**Determine whether each pair of triangles can be proven similar. If so, write the postulate used.**

8. $\frac{25}{10} = \frac{5}{2}$ $\frac{24}{6} = \frac{4}{1}$




Not similar

9. $\frac{15}{75} = \frac{2}{1}$ $\frac{8}{4} = \frac{2}{1}$




SAS, similar

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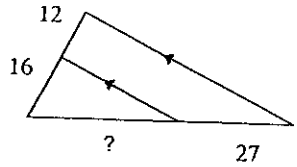
Name_____

# Proportional Parts in Triangles and Parallel Lines

Date_____ Period____

**Find the missing length indicated.**

1)

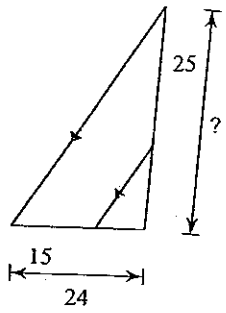



$\frac{16}{x} = \frac{12}{27}$

$432 = 12x$

$36 = x$

2)

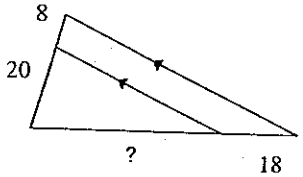



$\frac{15}{24} = \frac{25}{x}$

$15x = 600$

$x = 40$

3)

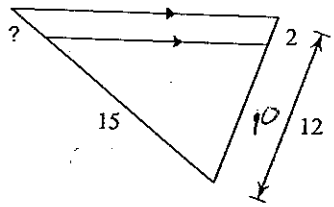



$\frac{20}{x} = \frac{8}{18}$

$360 = 8x$

$x = 45$

4)



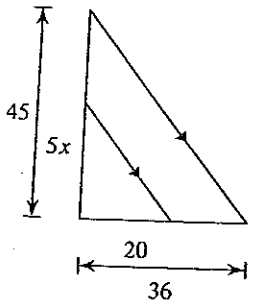

$\frac{2}{10} = \frac{x}{15}$

$30 = 10x$

$x = 3$

**Solve for *x*.**

5)

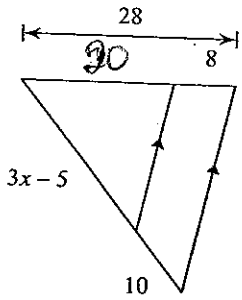



$\frac{5x}{45} = \frac{20}{36}$

$180x = 900$

$x = 5$ or $x = \frac{1}{2}$

6)




$\frac{8}{10} = \frac{20}{3x-5}$

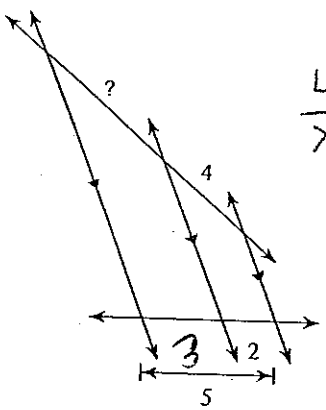
$200 = 24x - 40$

$240 = 24x$

$10 = x$

**Find the missing length indicated.**

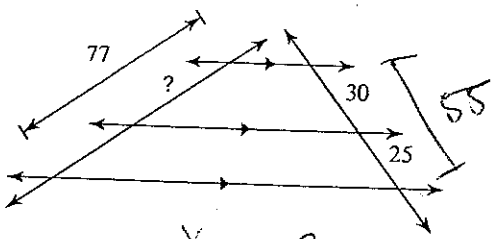
7)




$\frac{4}{x} = \frac{2}{3}$

$x = 6$

8)

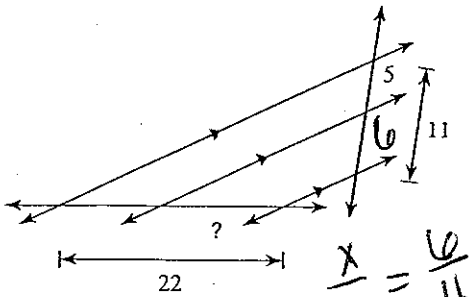



$\frac{x}{77} = \frac{30}{55}$

$55x = 2310$

$x = 42$

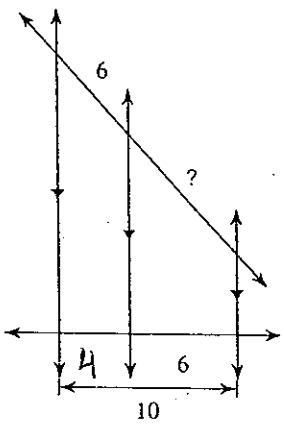
9)




$\frac{x}{22} = \frac{6}{11}$

$x = 12$

10)

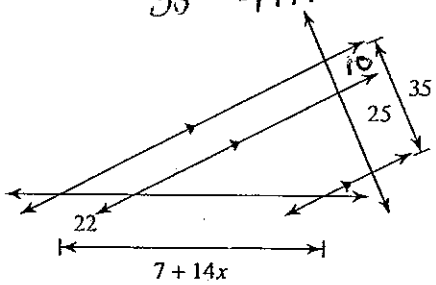



$\frac{4}{6} = \frac{6}{x}$

$x = 9$

**Solve for *x*.**

11)



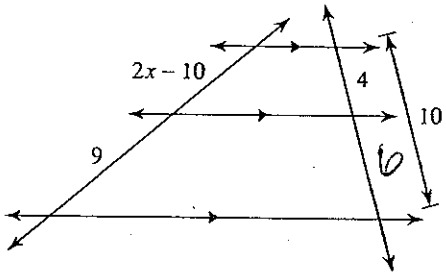

$\frac{10}{35} = \frac{22}{7+14x}$

$770 = 70 + 140x$

$700 = 140x$

$5 = x$

12)




$\frac{2x-10}{9} = \frac{4}{6}$

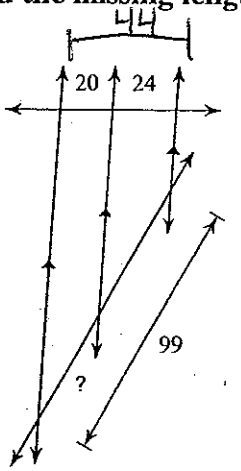
$12x - 60 = 36$

$12x = 96$

$x = 8$

**Find the missing length indicated.**

13)

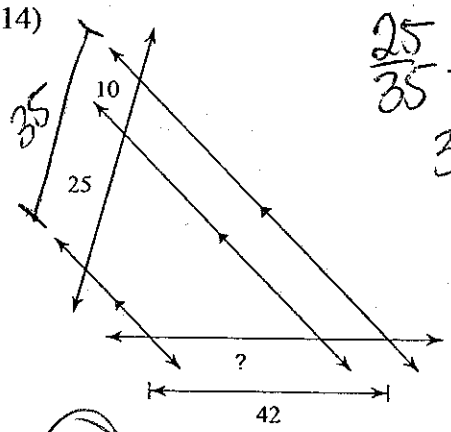



$\frac{20}{44} = \frac{x}{99}$

$1980 = 44x$

$45 = x$

14)

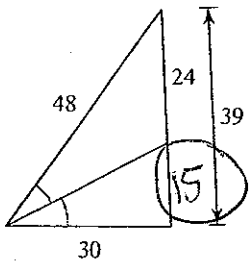



$\frac{25}{35} = \frac{x}{42}$

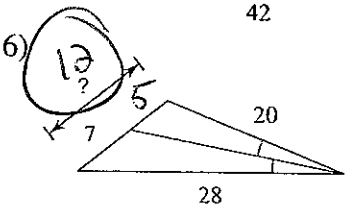
$35x = 1050$

$x = 30$

15)




16)



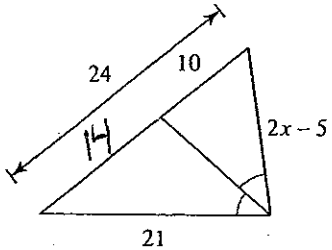

$\frac{7}{28} = \frac{x}{20}$

$140 = 28x$

$x = 5$

**Solve for *x*.**

17)



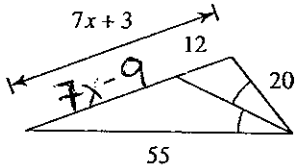

$\frac{2x-5}{10} = \frac{21}{14}$

$210 = 28x - 70$

$280 = 28x$

$10 = x$

18)




$\frac{12}{20} = \frac{7x-9}{55}$

$660 = 140x - 180$

$840 = 140x$

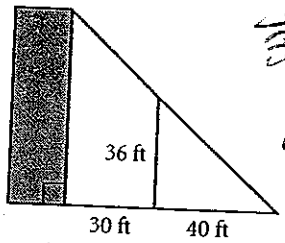
$x = 6$

NAME _____ CLASS _____ DATE _____

# Practice

## 8.5 Indirect Measurement and Additional Similarity Theorems

**In Exercises 1–4, use the diagrams to find the height of each building.**

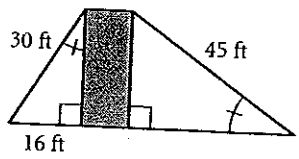
1. 


$\frac{40}{36} = \frac{70}{x}$

$2520 = 40x$

$x = 63$ ft

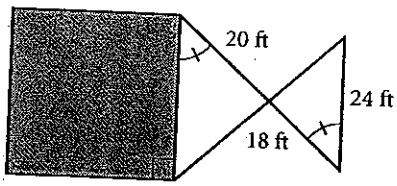
2. AA




$\frac{16}{x} = \frac{30}{45}$

$720 = 30x$

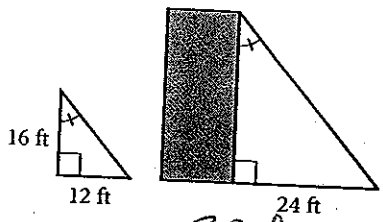
$x = 24$ ft

3. 


$\frac{18}{30} = \frac{24}{x}$

$480 = 18x$

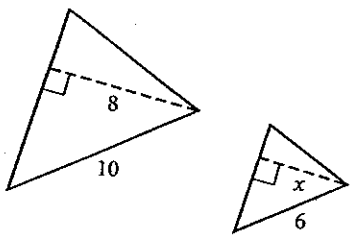
$x = 26.67$ ft

4. 


$\frac{16}{x} = \frac{12}{24}$

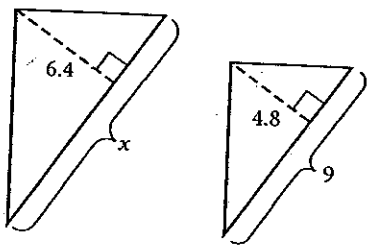
$x = 32$ ft

**In Exercises 5–8, the triangles are similar. Find *x*.**

5. 


$\frac{8}{x} = \frac{10}{6}$

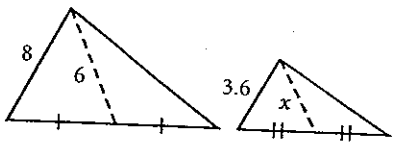
$x = 4.8$

6. 


$\frac{6.4}{4.8} = \frac{x}{9}$

$57.6 = 4.8x$

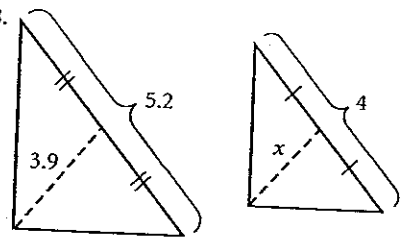
$x = 12$

7. 


$\frac{8}{3.6} = \frac{6}{x}$

$8x = 21.6$

$x = 2.7$

8. 


$\frac{3.9}{x} = \frac{5.2}{4}$

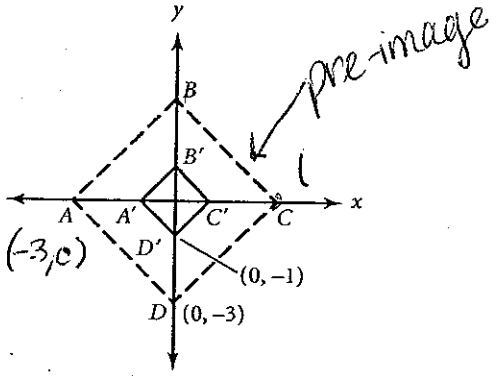
$x = 3$

NAME _____ CLASS _____ DATE _____

# Chapter Assessment

## *Chapter 8, Form B, page 1*

**The dashed square at right represents the preimage of a dilation. The solid figure represents its image.**



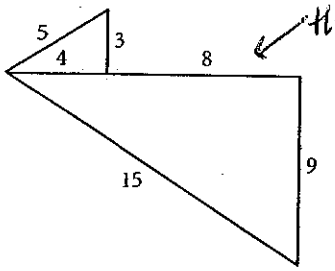

1. What is the scale factor of the dilation? 1/3
2. What are the coordinates of the image of $B$? (0, 1)
3. What are the coordinates of the preimage of $C'$? (3, 0)
4. Suppose that point $A$ is transformed by the dilation $D(x, y) = (2x, 2y)$. What are the coordinates of this image of $A$? (−6, 0)
5. If $\frac{x}{18} = \frac{12.5}{45}$, then $x =$ 5. $225 = 45x$
6. If $\frac{x}{45} = \frac{12.5}{18}$, then $x =$ 31.25. $562.5 = 18x$

$-3n = -1$

$\frac{-3}{-3} \quad \frac{-1}{-3}$

$n = \frac{1}{3}$

**Can the pair of triangles below be proven similar? Explain why or why not.**




this side is 12!

$\frac{3}{9} = \frac{1}{3}$

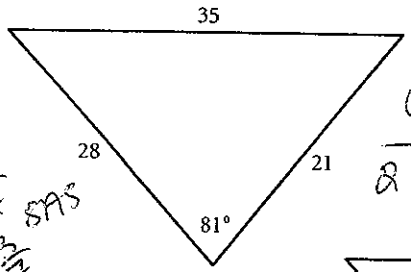
$\frac{4}{12} = \frac{1}{3}$

$\frac{5}{15} = \frac{1}{3}$

Yes, similar SSS

**Solve for $x$ in each pair of figures.**

8.

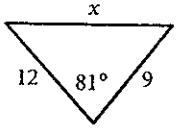



$315 = 21x$

$\frac{9}{21} = \frac{x}{35}$

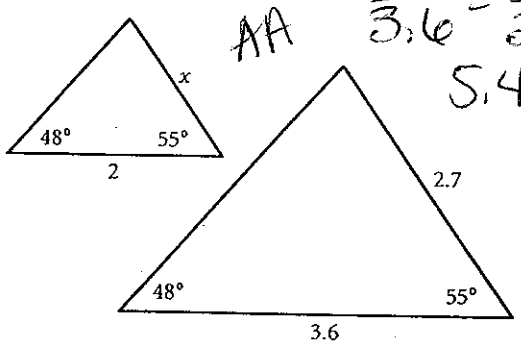
$\frac{9}{21} = \frac{3}{7}$ SAS

$\frac{12}{28} = \frac{3}{7}$




$x = 15$

9.




AA

$\frac{2}{3.6} = \frac{x}{2.7}$

$5.4 = 3.6x$

$x = 1.5$

NAME _____ CLASS _____ DATE _____

# Chapter Assessment

## Chapter 8, Form B, page 2

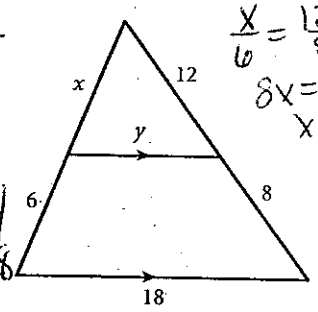
$\frac{12}{9} = \frac{36}{x}$ $324 = 12x$

10. In $\triangle ABC$ and $\triangle DEF$, the length of $\overline{AB}$ is 12 and the length of $\overline{DE}$ is 9. If $\triangle ABC \sim \triangle DEF$ and the perimeter of $\triangle ABC$ is 36, what is the perimeter of $\triangle DEF$?

27

**Solve for *x* and *y* in each figure.**

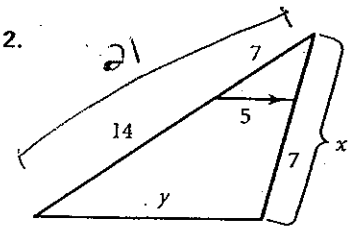
11.




$\frac{12}{20} = \frac{y}{18}$ $216 = 20y$ $y = 10.8$ $\frac{x}{6} = \frac{12}{8}$ $8x = 72$ $x = 9$

$x = 9, y = 10.8$

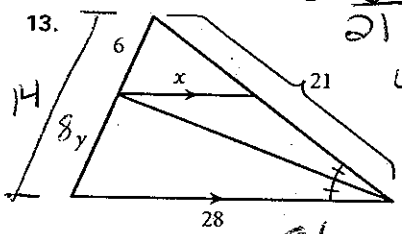
12.




$\frac{7}{x} = \frac{14}{21}$ $x = 10.5$ $\frac{7}{21} = \frac{5}{y}$ $y = 15$

$x = 10.5, y = 15$

13.




$\frac{6}{21} = \frac{4}{28}$ $y = 8$ $\frac{6}{14} = \frac{x}{28}$ $x = 12$

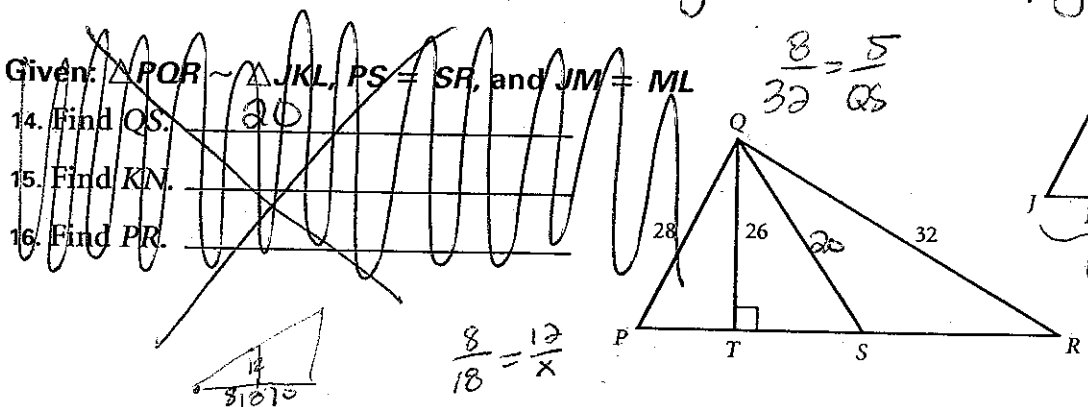
$x = 12, y = 8$

**Given: $\triangle PQR \sim \triangle JKL$, $PS = SR$, and $JM = ML$**

14. Find $QS$. 20

15. Find $KN$.

16. Find $PR$.



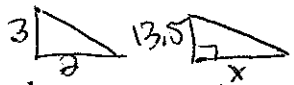

$\frac{8}{32} = \frac{5}{QS}$ $\frac{8}{18} = \frac{12}{x}$

17. Aaron placed an object 18 cm away from a lens. A 12-cm image formed 8 cm away from the lens. How tall was the object?

27 cm

18. A yardstick casts a 2-foot shadow. How long is the shadow cast by a $13\frac{1}{2}$-foot tree?

3 ft




$\frac{3}{13.5} = \frac{2}{x}$

9 ft

19. Roberto wants to enlarge a 10-cm by 15-cm photo by 30%. Find the area of the enlarged photo.

$13 \times 19.5$

$253.5\ cm^2$

20. Two pipes are similar cylinders whose lengths have a ratio of $\frac{3}{2}$. The smaller pipe can hold $2\frac{2}{3}$ gallons of water. How much water can the larger pipe hold?

| S | A | V |
|---|---|---|
| 3 | | x |
| 2 | | $2\frac{2}{3}$ |

$\frac{x}{2\frac{2}{3}} = \frac{27}{8}$

9 gallons