

LESSON 6.1 Practice B For use with pages 356–363

Simplify the ratio.

- \$12:\$16 $\frac{3}{4}$
- $\frac{32 \text{ in.}^2}{8 \text{ in.}^2}$ $\frac{4}{1}$
- $\frac{6 \text{ cm}}{14 \text{ cm}}$ $\frac{3}{7}$
- $\frac{10 \text{ in.}}{2 \text{ ft}}$ $\frac{5}{12}$
- 3 gallons:10 quarts $\frac{6}{5}$
- 28 oz:2 lb $\frac{7}{8}$

Find the ratio of the width to the length of the rectangle. Then simplify the ratio.

- $\frac{4 \text{ cm}}{12 \text{ cm}}$ $\frac{1}{3}$
- $\frac{6 \text{ in.}}{10 \text{ in.}}$ $\frac{3}{5}$
- $\frac{12 \text{ in.}}{18 \text{ in.}}$ $\frac{2}{3}$

Use the number line to find the ratio of the distances.

-
- $\frac{AB}{CF}$ $\frac{1}{2}$
 - $\frac{BF}{CD}$ $\frac{4}{1}$
 - $\frac{DE}{AC}$ $\frac{1}{5}$
 - $\frac{BE}{AD}$ $\frac{5}{7}$

14. Perimeter The perimeter of a rectangle is 56 inches. The ratio of the length to the width is 6:1. Find the length and the width. $24 \text{ in.}, 4 \text{ in.}$

15. Area The area of a rectangle is 525 square centimeters. The ratio of the length to the width is 7:3. Find the length and the width. $35 \text{ cm}, 15 \text{ cm}$

The measures of the angles of a triangle are in the extended ratio given. Find the measures of the angles of the triangle.

- 1:7:10 $10^\circ, 70^\circ, 100^\circ$
- 5:6:7 $50^\circ, 60^\circ, 70^\circ$
- 7:14:15 $35^\circ, 70^\circ, 75^\circ$

Solve the proportion.

- $\frac{4}{5} = \frac{x}{15}$ 12
- $\frac{5}{8} = \frac{20}{y}$ 32
- $\frac{x+2}{4} = \frac{27}{12}$ 7
- $\frac{3}{x} = \frac{1}{x-6}$ 9
- $\frac{3}{m+5} = \frac{2}{m+1}$ 7
- $\frac{2}{k-1} = \frac{5}{3k-4}$ 3

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Find the geometric mean of the two numbers.

- 2 and 8 4
- 3 and 9 $3\sqrt{3}$
- 7 and 14 $7\sqrt{2}$
- 8 and 16 $8\sqrt{2}$
- 10 and 12 $2\sqrt{30}$
- 9 and 13 $3\sqrt{13}$

Let $x = 6$, $y = 3$, and $z = 2$. Write the ratio in simplest form.

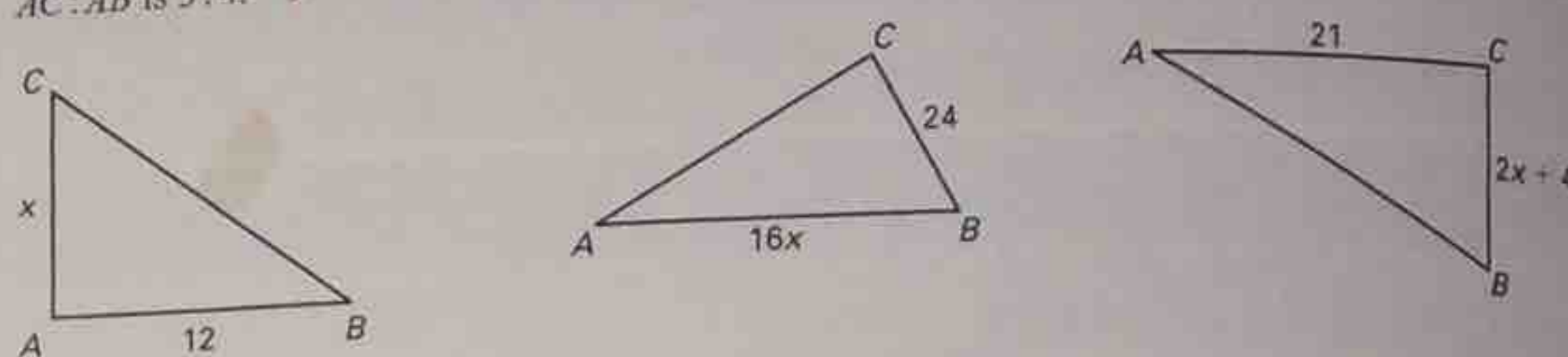
- $\frac{2x+y}{3}$ $\frac{5}{1}$
- $\frac{4z-3}{x}$ $\frac{5}{6}$
- $\frac{z+2y}{2x-4}$ $\frac{1}{1}$

Solve the proportion.

- $\frac{12}{x} = \frac{x}{4}$ $\pm 4\sqrt{3}$
- $\frac{y-2}{2} = \frac{2y-3}{5}$ 4
- $\frac{8}{x-2} = \frac{x+2}{4}$ ± 6

In Exercises 37–39, the ratio of two side lengths for the triangle is given. Solve for the variable.

- $AC:AB$ is 3:4. 9
- $AB:CB$ is 2:1. 3
- $AC:BC$ is 7:4. 4



40. Area The perimeter of the rectangular front lawn of the library is 192 feet. The ratio of the length to the width is 5:3. Find the area of the lawn. 2160 ft^2

In Exercises 41 and 42, use the following information.

Golden Gate Bridge You purchase a scale model of the Golden Gate Bridge which is located near San Francisco, California. The model states that the scale is 1 inch:50 feet. The actual length of the bridge is 8980 feet.

- What is the length of the model? 179.6 in.
- The model is approximately 15 inches tall. What is the actual height of the bridge? 750 ft



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Copy and complete the statement.

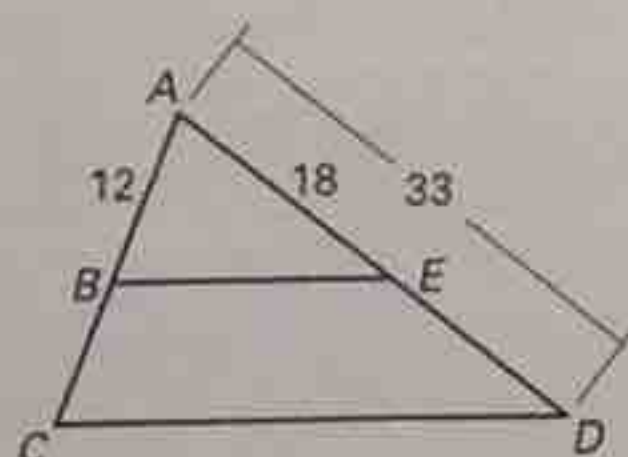
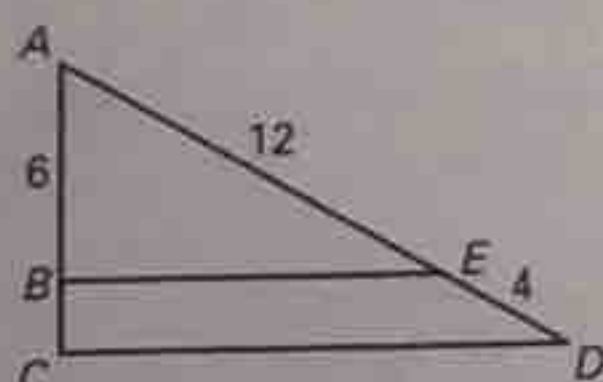
- If $\frac{6}{x} = \frac{5}{y}$, then $\frac{6}{5} = \frac{x}{y}$.
- If $\frac{x}{12} = \frac{y}{26}$, then $\frac{x}{y} = \frac{12}{26}$.
- If $\frac{x}{4} = \frac{7}{y}$, then $\frac{x+4}{4} = \frac{7}{y} + \frac{y+7}{y}$.
- If $\frac{9}{2} = \frac{x}{y}$, then $\frac{11}{2} = \frac{7}{y} + \frac{x+7}{y}$.

Decide whether the statement is true or false.

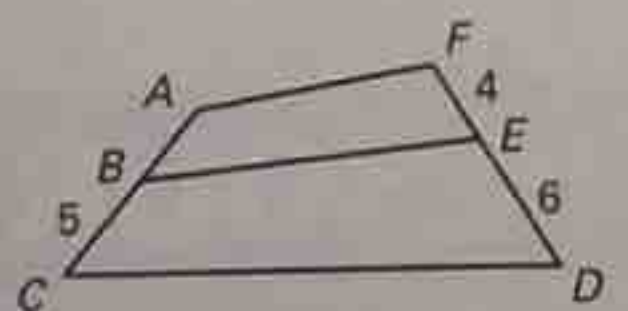
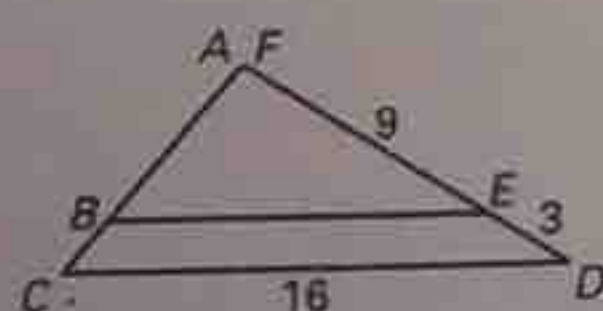
- If $\frac{x}{y} = \frac{8}{3}$, then $\frac{y}{x} = \frac{3}{8}$. **true**
- If $\frac{x}{y} = \frac{8}{3}$, then $\frac{3}{x} = \frac{y}{8}$. **false**
- If $\frac{x}{y} = \frac{8}{3}$, then $\frac{x}{8} = \frac{3}{y}$. **false**
- If $\frac{x}{y} = \frac{8}{3}$, then $\frac{x}{8} = \frac{y}{3}$. **true**
- If $\frac{x}{y} = \frac{8}{3}$, then $\frac{x+8}{8} = \frac{y+3}{3}$. **true**
- If $\frac{x}{y} = \frac{8}{3}$, then $\frac{x+2y}{y} = \frac{14}{3}$. **true**

Use the diagram and the given information to find the unknown length.

- Given $\frac{AB}{BC} = \frac{AE}{ED}$, find BC . 2
- Given $\frac{AB}{BC} = \frac{AE}{ED}$, find BC . 10



- Given $\frac{FD}{FE} = \frac{CD}{BE}$, find BE . 12
- Given $\frac{AB}{BC} = \frac{FE}{ED}$, find AC . $\frac{25}{3}$



15. Multiple Choice If m , n , p , and q are four different numbers, and the proportion $\frac{m}{n} = \frac{p}{q}$ is true, which of the following is false? **B**

- $mq = pn$
- $m = p$ and $n = q$
- $\frac{n+m}{m} = \frac{q+p}{p}$

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16. Error Analysis Describe and correct the error made in the reasoning.
If $\frac{a}{5} = \frac{b}{3}$, then $\frac{5}{a} = \frac{b}{3}$. **If two ratios are equal, then their reciprocals are equal.**
If $\frac{a}{5} = \frac{b}{3}$, then $\frac{5}{a} = \frac{3}{b}$.

17. Map Scale On a map, two neighboring towns are 2.4 inches apart. The actual straight line distance between the two towns is 36 miles. What is the scale of the map? $1 \text{ in.} : 15 \text{ mi}$

18. Collinear Points The points $(-3, -3)$, $(-1, 1)$, and $(2, y)$ are collinear.

Find the value of y by solving the proportion: $\frac{1 - (-3)}{-1 - (-3)} = \frac{y - 1}{2 - (-1)}$ 7

19. Sales Tax You plan on purchasing a new \$25,000 vehicle. Recently, a friend bought a \$22,500 vehicle and paid an additional \$1575 in sales tax. Assuming the same sales tax rate applies, how much should you expect to pay in sales tax? $\$1750$

In Exercises 20 and 21, use the following information.

Scale Model You purchase a scale model of a train. The model states that the scale is 1 inch:5.4 feet.



- If the model is 10 inches long, how long is the actual train? 54 ft
- The actual height of the train is 13.5 feet, how tall is the model? 2.5 in.

In Exercises 22 and 23, use the following information.

Mexican Pesos In November, 2005, the exchange rate of Mexican pesos to American dollars was 10.77 to 1. While on vacation, you paid 205 pesos for a sombrero at a gift shop.

- What was the price of the sombrero in American dollars? $\$19.03$
- If the exchange rate were 9.24 Mexican pesos to 1 American dollar, what would have the cost been in American dollars? $\$22.19$

In Exercises 24 and 25, use the following information.

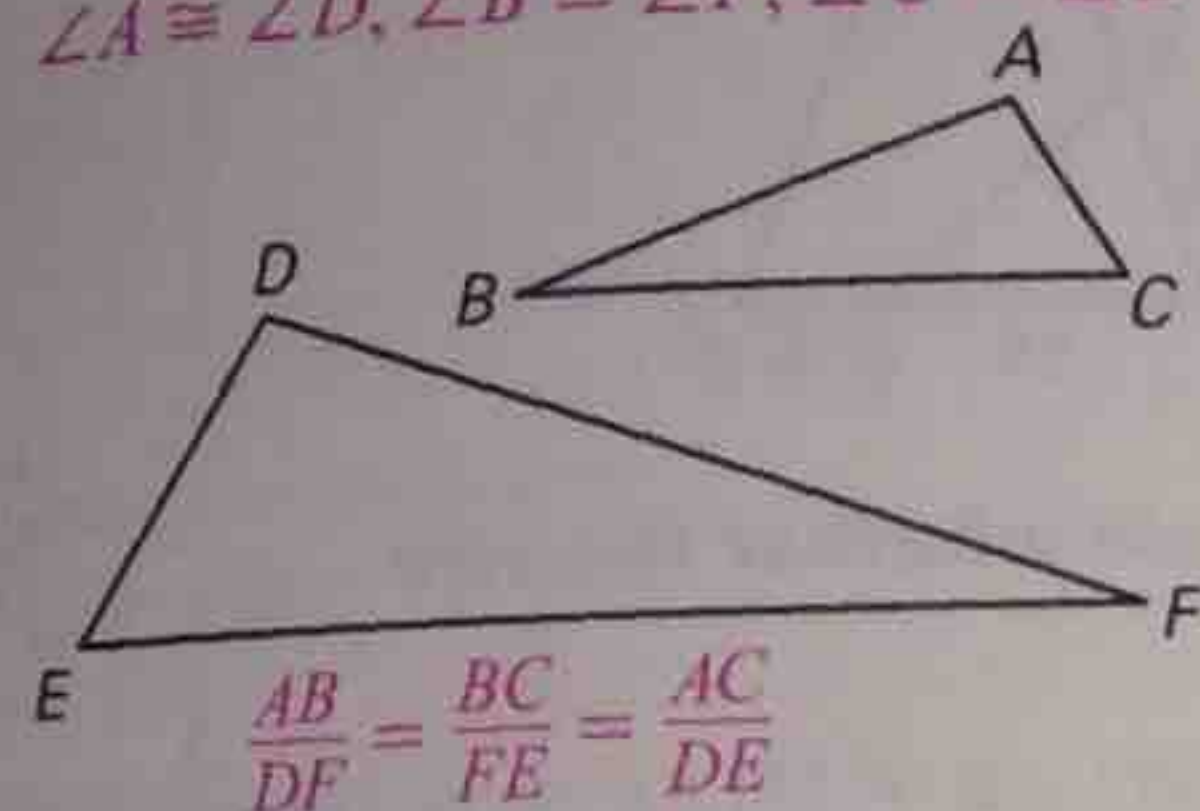
Canadian Dollars In November, 2005, the exchange rate of Canadian dollars to American dollars was 1 to 0.85. A Canadian citizen paid \$12.28 in American dollars for lunch while visiting New York City.

- What was the price of the lunch in Canadian dollars? $\$14.45$
- If the exchange rate were 1.28 Canadian dollars to 1 American dollar, what would have the cost been in Canadian dollars? $\$15.72$

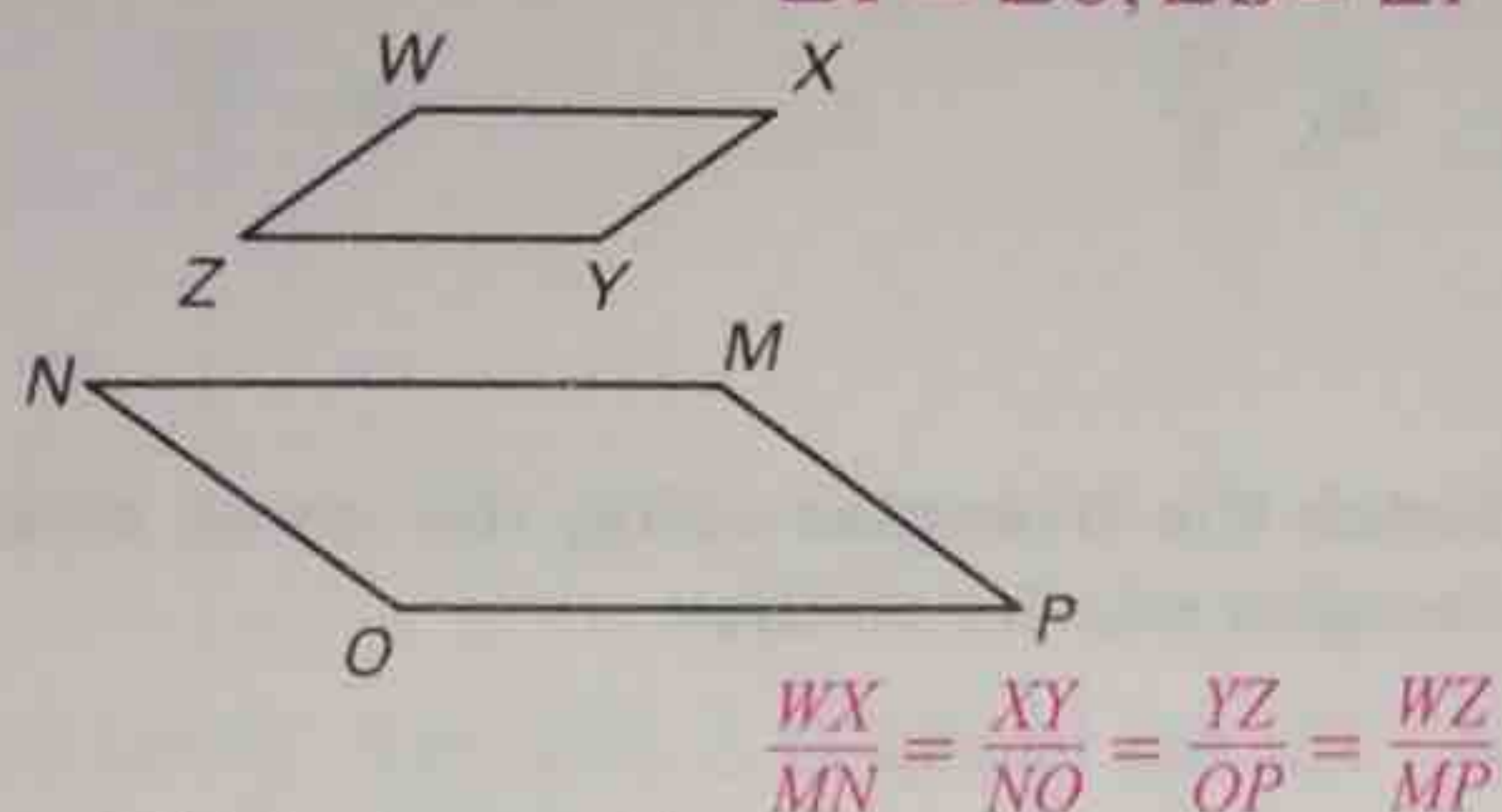
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List all pairs of congruent angles for the figures. Then write the ratios of the corresponding sides in a statement of proportionality.

1. $\triangle ABC \sim \triangle DFE$
 $\angle A \cong \angle D, \angle B \cong \angle F, \angle C \cong \angle E$



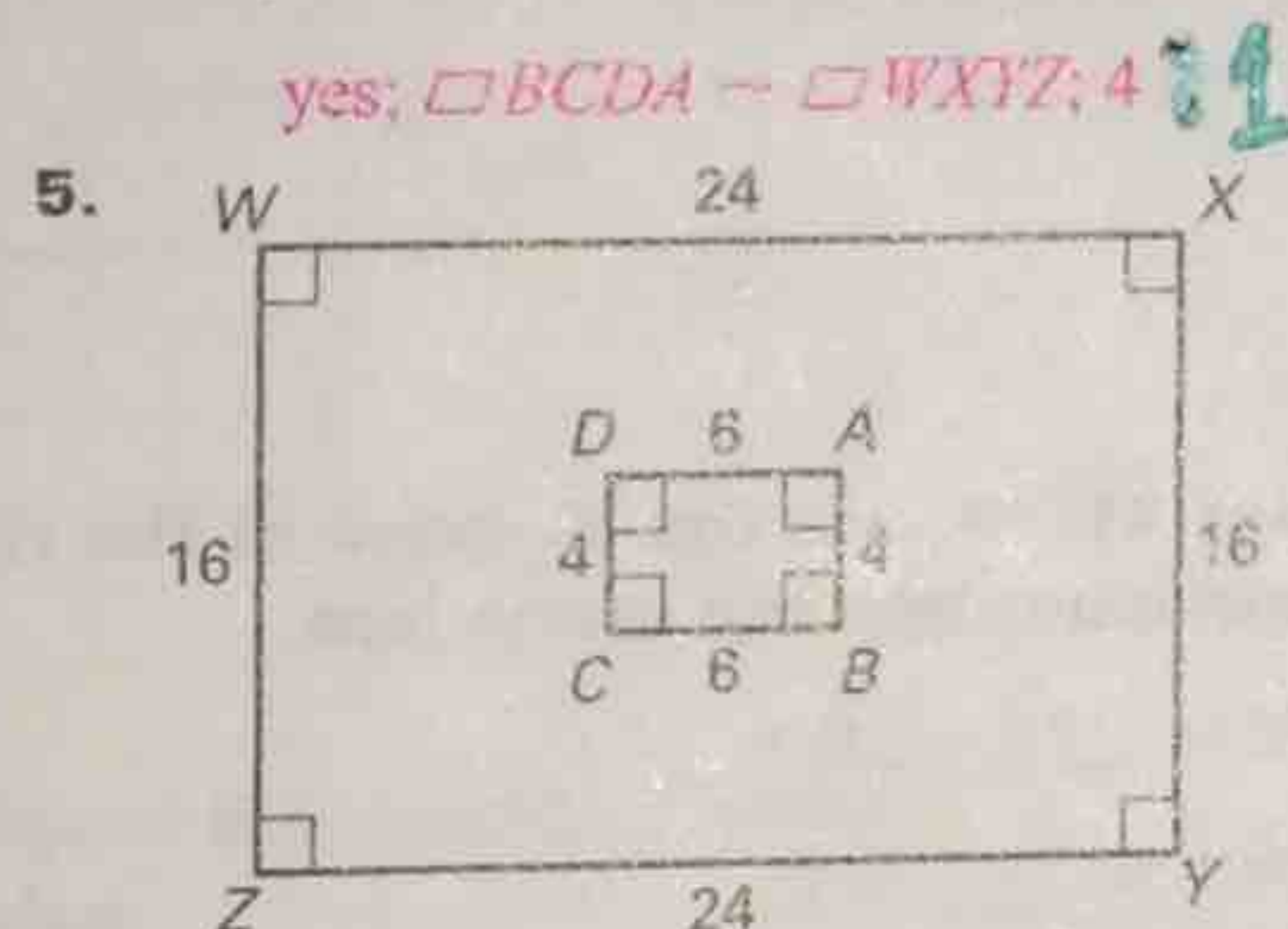
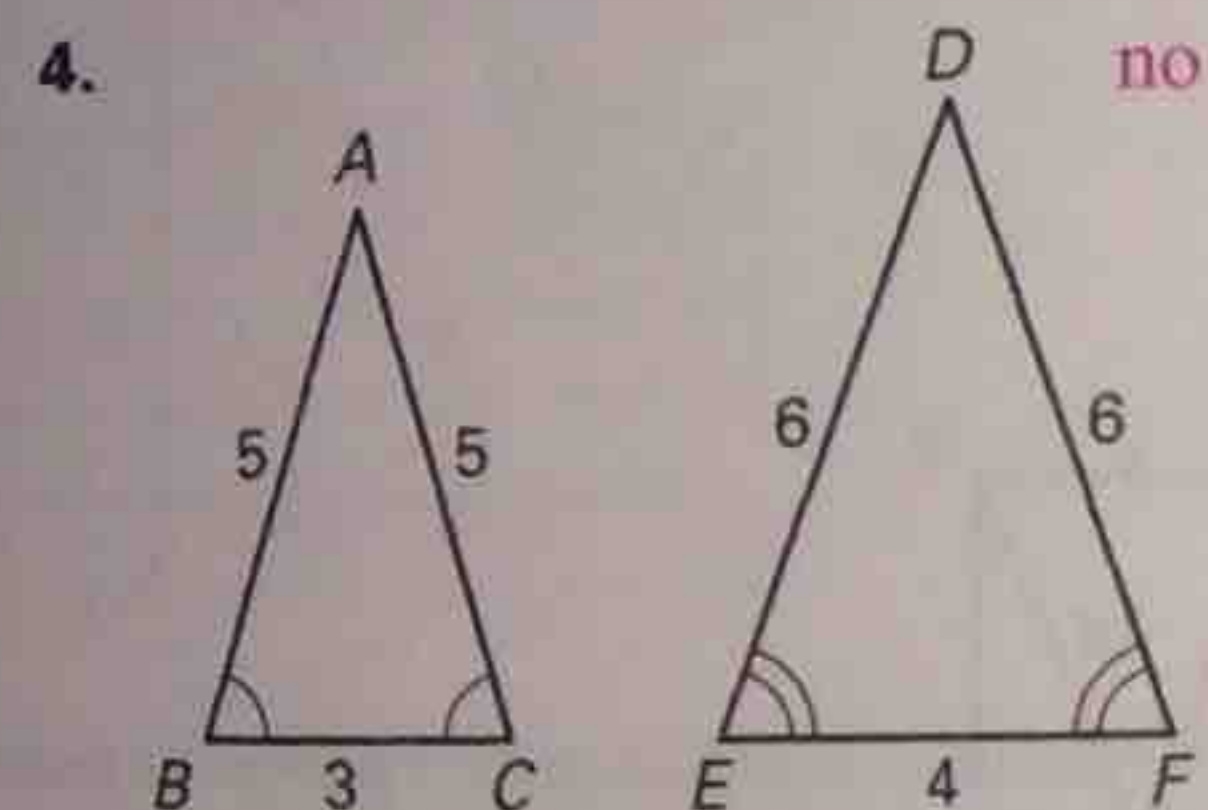
2. $\square WXYZ \sim \square MNOP$ $\angle W \cong \angle M, \angle X \cong \angle N, \angle Y \cong \angle O, \angle Z \cong \angle P$



3. **Multiple Choice** Triangles ABC and DEF are similar. Which statement is not correct? **C**

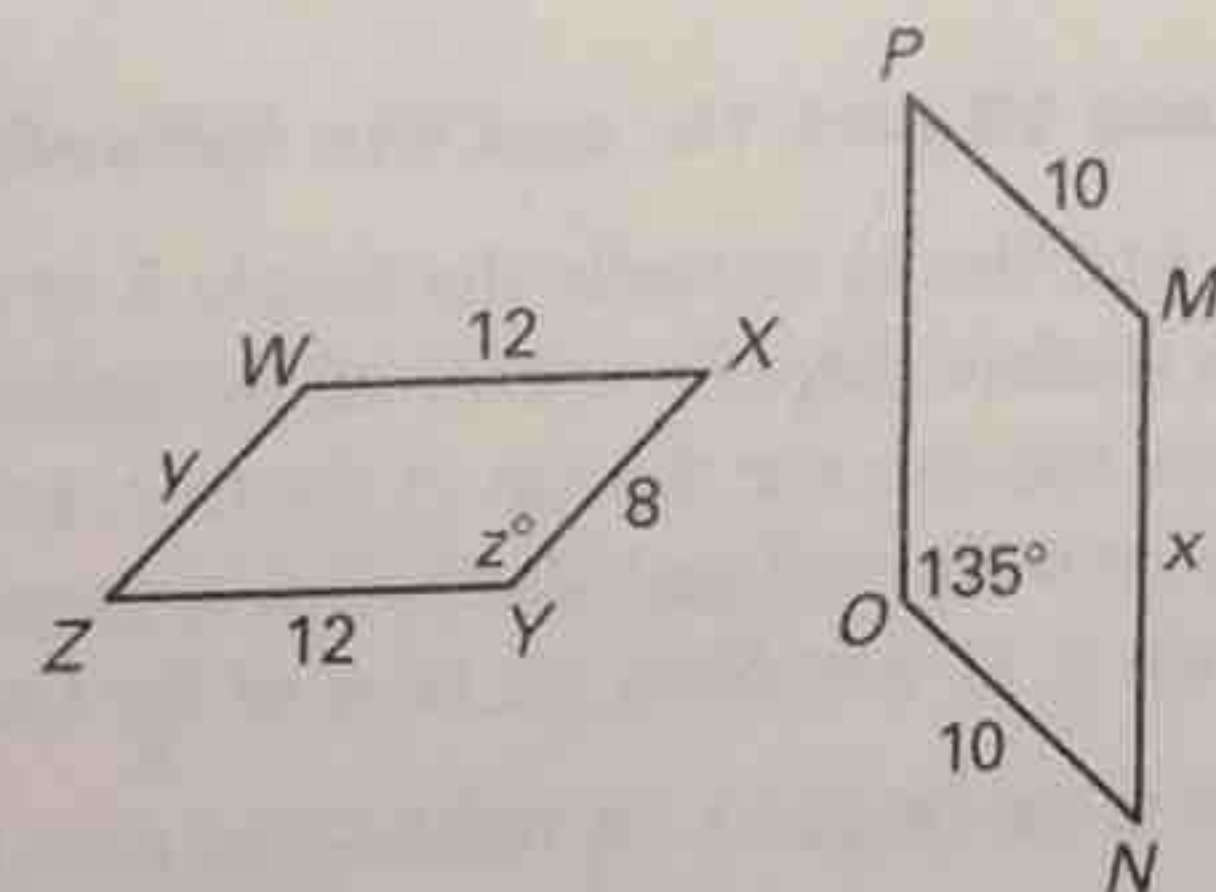
- A. $\frac{AB}{DE} = \frac{BC}{EF}$ B. $\frac{CA}{FD} = \frac{AB}{DE}$ C. $\angle A \cong \angle F$

Determine whether the polygons are similar. If they are, write a similarity statement and find the scale factor.



In the diagram, $WXYZ \sim MNOP$.

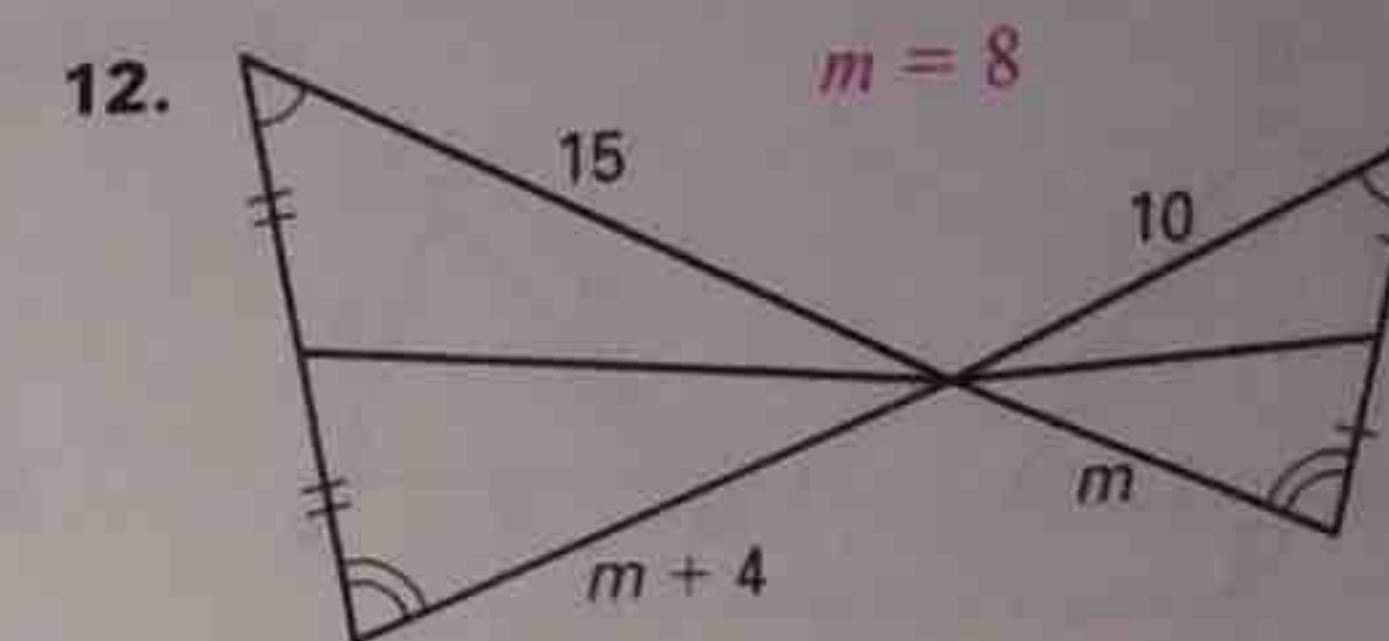
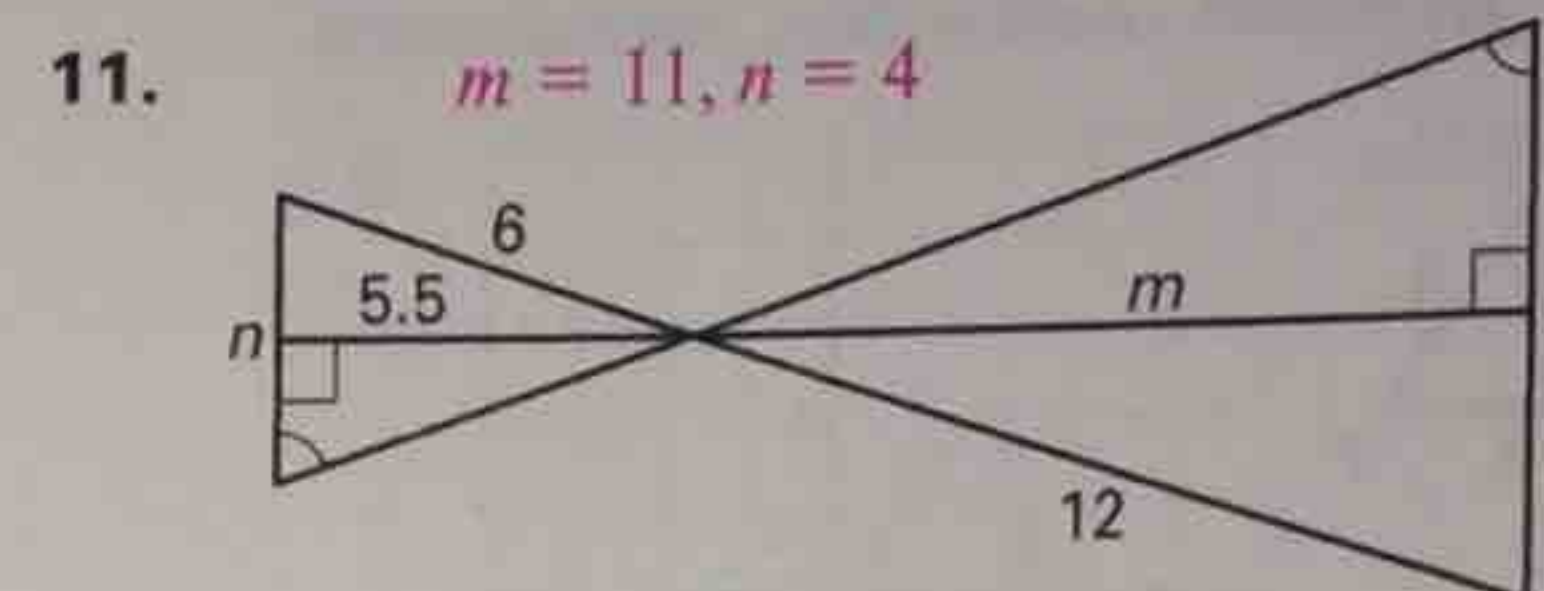
6. Find the scale factor of $WXYZ$ to $MNOP$. $\frac{4}{5}$
7. Find the values of x, y and z . **15, 8, 135**
8. Find the perimeter of $WXYZ$. **40**
9. Find the perimeter of $MNOP$. **50**
10. Find the ratio of the perimeter of $MNOP$ to the perimeter of $WXYZ$. $\frac{5}{4}$



LESSON 6.3

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The two triangles are similar. Find the value of the variables.



In Exercises 13 and 14, use the following information.

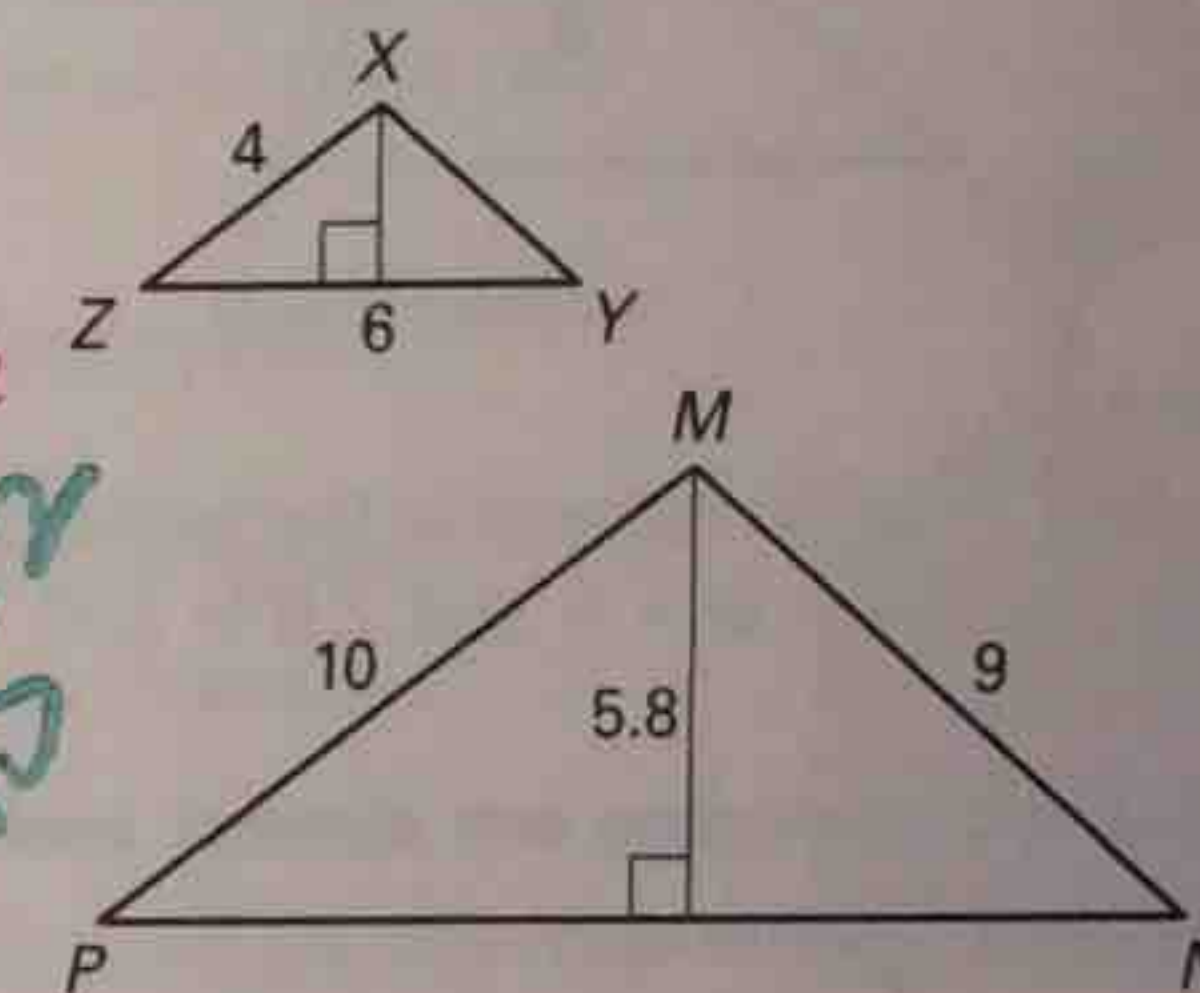
Similar Triangles Triangles RST and WXY are similar. The side lengths of $\triangle RST$ are 10 inches, 14 inches, and 20 inches, and the length of an altitude is 6.5 inches. The shortest side of $\triangle WXY$ is 15 inches long.

13. Find the lengths of the other two sides of $\triangle WXY$. **$XY = 30$ in., $WY = 21$ in.**
14. Find the length of the corresponding altitude in $\triangle WXY$. **9.75 in.**
15. **Multiple Choice** The ratio of one side of $\triangle ABC$ to the corresponding side of a similar $\triangle DEF$ is 4:3. The perimeter of $\triangle DEF$ is 24 inches. What is the perimeter of $\triangle ABC$? **C**

- A. 18 inches B. 24 inches C. 32 inches

In the diagram, $\triangle XYZ \sim \triangle MNP$.

16. Find the scale factor of $\triangle XYZ$ to $\triangle MNP$. $\frac{2}{5}$
17. Find the unknown side lengths of both triangles. **$XY = 3.6, PN = 15$**
18. Find the length of the altitude shown in $\triangle XYZ$. **2.32**
19. Find and compare the areas of both triangles. **Area of $\triangle XYZ = 6.96$; Area of $\triangle MNP = 43.5$; The area of similar triangles differ by the scale factor squared.**



In Exercises 20–22, use the following information.

Swimming Pool The community park has a rectangular swimming pool enclosed by a rectangular fence for sunbathing. The shape of the pool is similar to the shape of the fence. The pool is 30 feet wide. The fence is 50 feet wide and 100 feet long.

20. What is the scale factor of the pool to the fence? $\frac{3}{5}$
21. What is the length of the pool? **60 ft**
22. Find the area reserved strictly for sunbathing. **3200 ft²**