

## Practice Test - Chapter 7

**Solve each proportion.**

1.  $\frac{3}{7} = \frac{12}{x}$

**SOLUTION:**

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

Cross multiply.

$$3x = 84$$

Solve for  $x$ .

$$x = 28$$

**ANSWER:**

28

2.  $\frac{2x}{5} = \frac{x+3}{3}$

**SOLUTION:**

$$\frac{2x}{5} = \frac{x+3}{3}$$

Cross multiply.

$$3(2x) = 5(x+3)$$

Solve for  $x$ .

$$6x = 5x + 15$$

$$x = 15$$

**ANSWER:**

15

## Practice Test - Chapter 7

$$3. \frac{4x}{15} = \frac{60}{x}$$

*SOLUTION:*

$$\frac{4x}{15} = \frac{60}{x}$$

Cross multiply.

$$4x^2 = 900$$

Solve for  $x$ .

$$\begin{aligned}\frac{4x^2}{4} &= \frac{900}{4} \\ x^2 &= 225 \\ x &= \pm 15\end{aligned}$$

*ANSWER:*

15 or  $-15$

$$4. \frac{5x-4}{4x+7} = \frac{13}{11}$$

*SOLUTION:*

$$\frac{5x-4}{4x+7} = \frac{13}{11}$$

Cross multiply.

$$11(5x-4) = 13(4x+7)$$

Solve for  $x$ .

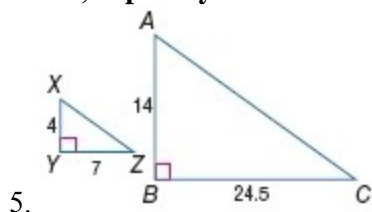
$$\begin{aligned}55x - 44 &= 52x + 91 \\ 3x &= 135 \\ x &= 45\end{aligned}$$

*ANSWER:*

45

## Practice Test - Chapter 7

Determine whether each pair of figures is similar. If so, write the similarity statement and scale factor. If not, explain your reasoning.



**SOLUTION:**

yes;  $\triangle ABC \sim \triangle XYZ$  because the corresponding relationships of

$$\angle Y \cong \angle B$$

$$\frac{XY}{AB} = \frac{4}{14} = \frac{2}{7}$$

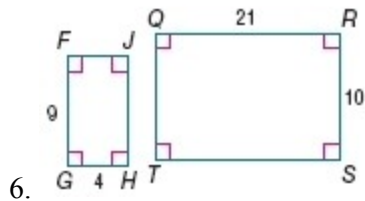
$$\frac{YZ}{BC} = \frac{7}{24.5} = \frac{14}{49} = \frac{2}{7}$$

meet the conditions for  $SAS \sim$  Theorem. Therefore, the triangles are similar,  $\frac{XY}{AB} = \frac{YZ}{BC}$ , and the scale factor is  $\frac{2}{7}$ .

**ANSWER:**

yes; Triangle  $ABC$  is similar to triangle  $XYZ$  because  $\angle Y \cong \angle B$  and  $\frac{XY}{AB} = \frac{YZ}{BC}$ ;  $\frac{2}{7}$ .

## Practice Test - Chapter 7



**SOLUTION:**

Step 1: Compare corresponding angles:

Since all of the angles in the polygons are right angles, they are all congruent to each other. Therefore, corresponding angles are congruent.

Step 2: Compare corresponding sides:

$$\frac{FG}{QR} = \frac{9}{21} = \frac{3}{7}$$

$$\frac{GH}{RS} = \frac{4}{10} = \frac{2}{5}$$

Since  $\frac{FG}{QR} \neq \frac{GH}{RS}$ , the figures are not similar.

**ANSWER:**

no;  $\frac{FG}{QR} \neq \frac{GH}{RS}$

## Practice Test - Chapter 7

7. **CURRENCY** Jane is traveling to Europe this summer with the French Club. She plans to bring \$300 to spend while she is there. If \$90 in U.S. currency is equivalent to 63 euros, how many euros will she receive when she exchanges her money?

**SOLUTION:**

Let the unknown number be  $x$ .

Form a proportion for the given information.

$$\frac{63 \text{ Euros}}{90 \text{ US Dollars}} = \frac{x \text{ Euros}}{300 \text{ US Dollars}}$$

$$\frac{63}{90} = \frac{x}{300}$$

Cross multiply.

$$63(300) = x(90)$$

Solve for  $x$ .

$$18900 = 90x$$

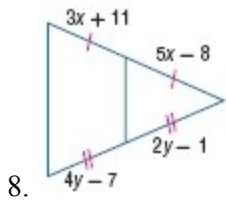
$$x = 210$$

**ANSWER:**

210

## Practice Test - Chapter 7

**ALGEBRA** Find  $x$  and  $y$ . Round to the nearest tenth if necessary.



**SOLUTION:**

it is given that  $3x + 11 = 5x - 8$  and  $4y - 7 = 2y - 1$ .

Solve for  $x$ .

$$\begin{aligned} 3x + 11 &= 5x - 8 \\ -2x &= -19 \\ x &= 9.5 \end{aligned}$$

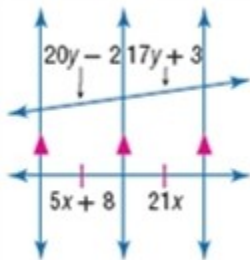
Solve for  $y$ .

$$\begin{aligned} 4y - 7 &= 2y - 1 \\ 2y &= 6 \\ y &= 3 \end{aligned}$$

**ANSWER:**

$$x = 9.5, y = 3$$

## Practice Test - Chapter 7



9.

**SOLUTION:**

We are given that  $21x = 5x + 8$ .

Solve for  $x$ .

$$21x = 5x + 8$$

$$16x = 8$$

$$x = 0.5$$

By Corollary 7.2, if three or more parallel lines cut off congruent segments on one transversal, then they cut off congruent segments on every transversal. Therefore,  $20y - 2 = 17y + 3$ .

Solve for  $y$ .

$$20y - 2 = 17y + 3$$

$$3y = 5$$

$$y \approx 1.7$$

**ANSWER:**

$$x = 0.5, y = 1.7$$

10. **ALGEBRA** Equilateral  $\triangle MNP$  has perimeter  $12a + 18b$ .  $\overline{QR}$  is a midsegment. What is  $QR$ ?

**SOLUTION:**

Let  $x$  be the length of each side of the triangle  $MNP$ .

The perimeter is  $12a + 18b$ .

$$x + x + x = 12a + 18b$$

$$3x = 12a + 18b$$

$$x = 4a + 6b$$

So, the length of each side is  $4a + 6b$ .

Therefore, the length of the midsegment is  $\left(\frac{1}{2}\right)4a + 6b$  or  $2a + 3b$ .

**ANSWER:**

$$2a + 3b$$

## Practice Test - Chapter 7

11. **ALGEBRA** Right isosceles  $\triangle ABC$  has hypotenuse length  $h$ .  $\overline{DE}$  is a midsegment with length  $4x$  that is not parallel to the hypotenuse. What is the perimeter of  $\triangle ABC$ ?

**SOLUTION:**

Since the isosceles triangle has the midsegment with length  $4x$ , the length of the each leg is  $2(4x)$  or  $8x$ .

Perimeter =  $8x + 8x + h$  or  $16x + h$

**ANSWER:**

$16x + h$

12. **SHORT RESPONSE** Jimmy has a diecast metal car that is a scale model of an actual race car. If the actual length of the car is 10 feet and 6 inches and the model has a length of 7 inches, what is the scale factor of model to actual car?

**SOLUTION:**

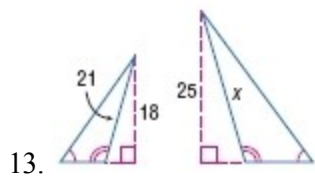
$$\begin{aligned}\frac{\text{length of the model}}{\text{length of the actual car}} &= \frac{7 \text{ inches}}{10 \text{ feet } 6 \text{ inches}} \\ &= \frac{7 \text{ inches}}{126 \text{ inches}} \\ &= \frac{1}{18}\end{aligned}$$

The scale factor of model to actual car is 1:18.

**ANSWER:**

1:18

**Find  $x$ .**



**SOLUTION:**

By AA Similarity, the given two triangles are similar. If two triangles are similar, the lengths of corresponding altitudes are proportional to the lengths of corresponding sides. We know the sides marked 18 and 25 are altitudes because they are perpendicular to the side opposite the vertex. Therefore,

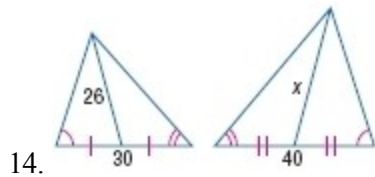
$$\begin{aligned}\frac{x}{21} &= \frac{25}{18} \\ 18x &= 525 \\ x &\approx 29.2\end{aligned}$$

**ANSWER:**

29.2



## Practice Test - Chapter 7



**SOLUTION:**

By AA Similarity, the given two triangles are similar. If two triangles are similar, the lengths of corresponding medians are proportional to the lengths of corresponding sides. We know the sides marked  $x$  and  $26$  are medians because they intersect the side opposite the vertex at its midpoint. Therefore,

$$\frac{x}{40} = \frac{26}{30}$$

$$30x = 1040$$

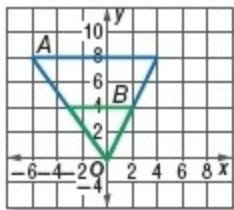
$$x \approx 34.7$$

**ANSWER:**

34.7

## Practice Test - Chapter 7

Determine whether the dilation from  $A$  to  $B$  is an *enlargement* or a *reduction*. Then find the scale factor of the dilation.



15.

**SOLUTION:**

$B$  is smaller than  $A$ , so the dilation is a reduction.

The distance between the vertices at  $(0, 0)$  and  $(2, 4)$  for  $B$  is

$$\begin{aligned} & \sqrt{(2-0)^2 + (4-0)^2} \\ & \sqrt{(2)^2 + (4)^2} \\ & \sqrt{4+16} \\ & \sqrt{20} = 2\sqrt{5} \end{aligned}$$

The distance between the vertices at  $(0, 0)$  and  $(4, 8)$  for  $B$  is

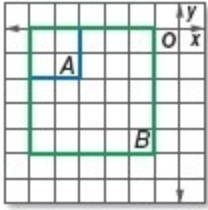
$$\begin{aligned} & \sqrt{(4-0)^2 + (8-0)^2} \\ & \sqrt{(4)^2 + (8)^2} \\ & \sqrt{16+64} \\ & \sqrt{80} = 4\sqrt{5} \end{aligned}$$

So the scale factor is  $\frac{2\sqrt{5}}{4\sqrt{5}} = \frac{1}{2}$ .

**ANSWER:**

reduction;  $\frac{1}{2}$

**Practice Test - Chapter 7**



16.

**SOLUTION:**

$B$  is larger than  $A$ , so the dilation is an enlargement.

The distance between the vertices at  $(-4, 0)$  and  $(-6, 0)$  for  $A$  is 2 and between the vertices at  $(-1, 0)$  and  $(-6, 0)$  for  $B$  is 5.

So the scale factor is  $\frac{5}{2}$ .

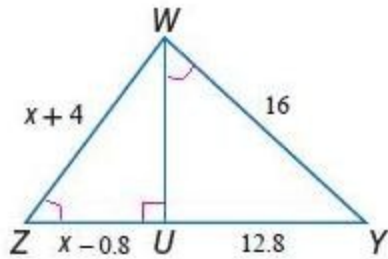
**ANSWER:**

enlargement;  $\frac{5}{2}$

## Practice Test - Chapter 7

**ALGEBRA** Identify the similar triangles. Find each measure.

17. WZ, UZ



**SOLUTION:**

$\triangle WUZ \sim \triangle YUW$  by AA Similarity;

Find WU using Pythagorean Theorem:

$$WU^2 + 12.8^2 = 16^2$$

$$WU^2 + 163.84 = 256$$

$$WU^2 = 92.16$$

$$WU = 9.6$$

We can set up and solve a proportion with corresponding sides:

$$\frac{WZ}{YW} = \frac{ZU}{WU}$$

$$\frac{x+4}{16} = \frac{x-0.8}{9.6}$$

$$9.6(x+4) = 16(x-0.8)$$

$$9.6x + 38.4 = 16x - 12.8$$

$$-6.4x = -51.2$$

$$x = 8$$

Therefore,  $WZ = (8)+4=12$  and  $UZ = (8)-0.8 = 7.2$

**ANSWER:**

$\triangle WUZ \sim \triangle YUW$  by AA Similarity; 12, 7.2