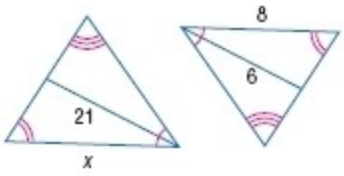
7-5 Parts of Similar Triangles

Find *x*.

6. 

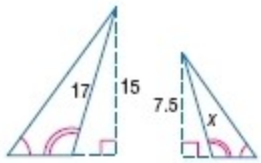
SOLUTION:

By AA Similarity, the given two triangles are similar. Theorem 7.9 states that if two triangles are similar, the lengths of corresponding angle bisectors are proportional to the lengths of corresponding sides. Therefore,

$$\frac{x}{8} = \frac{21}{6}$$
$$6x = 168$$
$$x = 28$$

ANSWER:

28

7. 

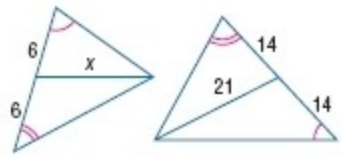
SOLUTION:

By AA Similarity, the given two triangles are similar. Theorem 7.8 states that if two triangles are similar, the lengths of corresponding altitudes are proportional to the lengths of corresponding sides.we know that the sides marked 15 and 7.5 are altitudes because they are perpendicular to the side opposite a vertex of the triangle. Therefore,

$$\frac{x}{17} = \frac{7.5}{15}$$
$$15x = 127.5$$
$$x = 8.5$$

ANSWER:

8.5

8. 

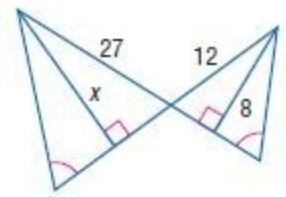
SOLUTION:

By AA Similarity, the given two triangles are similar. Theorem 7.10 states that if two triangles are similar, the lengths of corresponding medians are proportional to the lengths of corresponding sides. We know that the segments marked x and 21 are medians because they intersect the opposite side at its midpoint. Therefore,

$$\frac{x}{21} = \frac{12}{28}$$
$$28x = 252$$
$$x = 9$$

ANSWER:

9

9. 

SOLUTION:

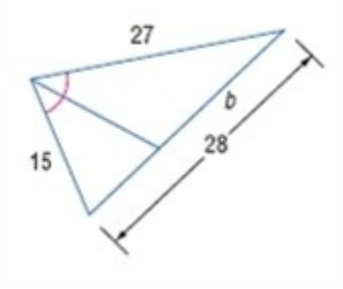
By AA Similarity, the given two triangles are similar.We know that the segments labeled x and 8 are altitudes because they are perpendicular to the side opposite a vertex. theorem 7.8 states that if two triangles are similar, the lengths of corresponding altitudes are proportional to the lengths of corresponding sides. Therefore,

$$\frac{x}{8} = \frac{27}{12}$$
$$12x = 216$$
$$x = 18$$

ANSWER:

18

ORGANIZE IDEAS **Find the value of each variable.**

11. 

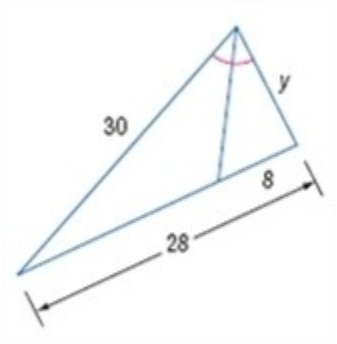
SOLUTION:

An angle bisector in a triangle separates the opposite side into two segments that are proportional to the lengths of the other two sides.

$$\frac{15}{27} = \frac{28-b}{b}$$
$$15b = 27(28-b)$$
$$15b = 756 - 27b$$
$$42b = 756$$
$$b = 18$$

ANSWER:

18

12. 

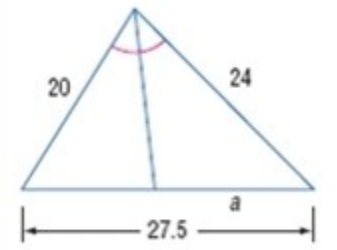
SOLUTION:

An angle bisector in a triangle separates the opposite side into two segments that are proportional to the lengths of the other two sides.

$$\frac{8}{28-8} = \frac{y}{30}$$
$$\frac{8}{20} = \frac{y}{30}$$
$$20y = 240$$
$$y = 12$$

ANSWER:

12

13. 

SOLUTION:

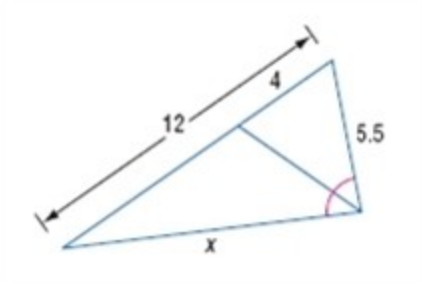
An angle bisector in a triangle separates the opposite side into two segments that are proportional to the lengths of the other two sides.

$$\frac{20}{24} = \frac{27.5-a}{a}$$
$$20a = 24(27.5-a)$$
$$20a = 660 - 24a$$
$$44a = 660$$
$$a = 15$$

ANSWER:

15

7-5 Parts of Similar Triangles

14. 

SOLUTION:

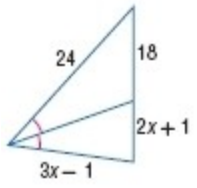
An angle bisector in a triangle separates the opposite side into two segments that are proportional to the lengths of the other two sides.

$$\frac{x}{5.5} = \frac{12-4}{4}$$
$$\frac{x}{5.5} = \frac{8}{4}$$
$$4x = 44$$
$$x = 11$$

ANSWER:

11

ALGEBRA Find *x*.

20. 

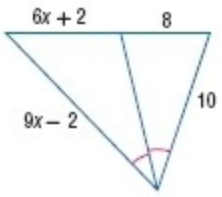
SOLUTION:

An angle bisector in a triangle separates the opposite side into two segments that are proportional to the lengths of the other two sides.

$$\frac{18}{2x+1} = \frac{24}{3x-1}$$
$$18(3x-1) = 24(2x+1)$$
$$54x - 18 = 48x + 24$$
$$6x = 42$$
$$x = 7$$

ANSWER:

7

21. 

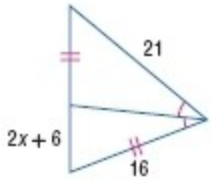
SOLUTION:

An angle bisector in a triangle separates the opposite side into two segments that are proportional to the lengths of the other two sides.

$$\frac{6x+2}{8} = \frac{9x-2}{10}$$
$$10(6x+2) = 8(9x-2)$$
$$60x + 20 = 72x - 16$$
$$12x = 36$$
$$x = 3$$

ANSWER:

3

22. 

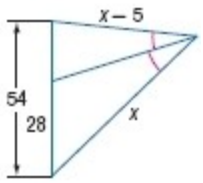
SOLUTION:

An angle bisector in a triangle separates the opposite side into two segments that are proportional to the lengths of the other two sides.

$$\frac{2x+6}{16} = \frac{16}{21}$$
$$21(2x+6) = 256$$
$$42x + 126 = 256$$
$$42x = 130$$
$$x \approx 3.1$$

ANSWER:

3.1

23. 

SOLUTION:

An angle bisector in a triangle separates the opposite side into two segments that are proportional to the lengths of the other two sides.

$$\frac{x-5}{x} = \frac{54-28}{28}$$
$$\frac{x-5}{x} = \frac{26}{28}$$
$$\frac{x-5}{x} = \frac{13}{14}$$
$$14(x-5) = 13x$$
$$14x - 70 = 13x$$
$$x = 70$$

ANSWER:

70