Name:_____

1. According the Triangle Inequality Theorem, the sum of any two sides of a triangle is greater than the _____.

2. Given three segments lengths, if the sum of the two _____ segments is greater than the third, then a triangle can be constructed.

3. A _____ is a comparison of two quantities.

4. A _____ is the equality of two ratios.

5. To solve a proportion you need to _____.

6. A proportion can be made easier to solve by _____ the ratios.

7. Two figures are similar if all the corresponding angles are _____ and the _____ of the corresponding sides are equal.

8. A _____ is a number used to determine how much bigger or smaller to figures are to each other.
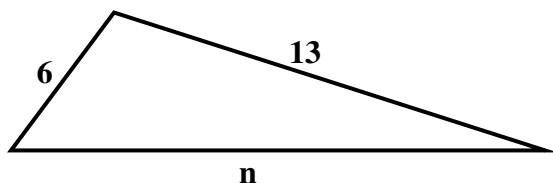
List the sides in order from shortest to longest.
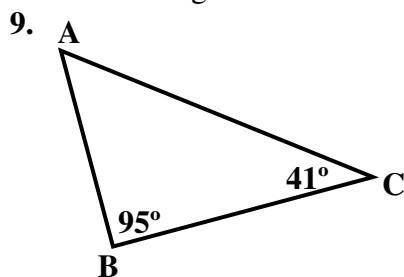
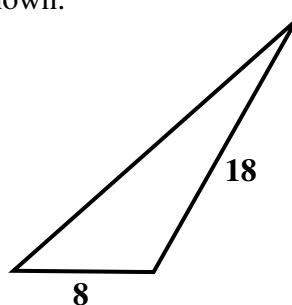List the angles in order from smallest to largest.
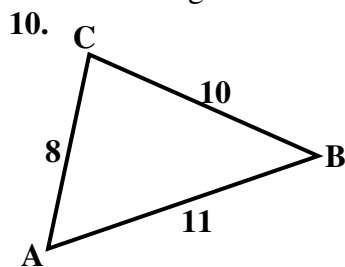
Determine if a triangle can be constructed with the given side lengths.

9.

10.

11. 4 cm, 2 cm, 5 cm

12. In the figure below, n is a whole number. What is the largest possible value for n?

13. The lengths of two sides of the triangle are known.

Which of the following could be the perimeter of the triangle?

A 10

B 26

C 20

D 37

14. The perimeter of a rectangle is 84 feet. The ratio of the width to the length is 2:5. Find the length and the width.

15. The <u>area</u> of a rectangle is $108 \, \text{cm}^2$. The ratio of the width to the length is 3:4. Find the length and the width.

16. The measures of the angles in a triangle are in the extended ratio of 2:15:19. Find the measures of the angles.
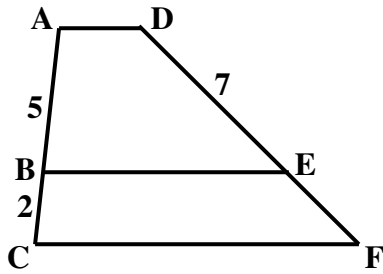
17. The measures of the angle is a triangle are in the extended ratio of 1:4:7. Find the measures of the angles.

18. Two gears, Gear A and Gear B, have a gear ratio of 2:3. If Gear A has 24 teeth, then how many teeth does Gear B have?
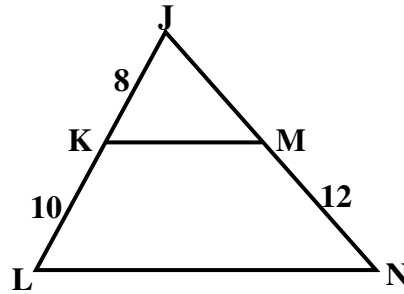
19. The ratios of the side lengths of $\triangle PQR$ to the corresponding side lengths of $\triangle STU$ are 2:3. Find the unknown side lengths.
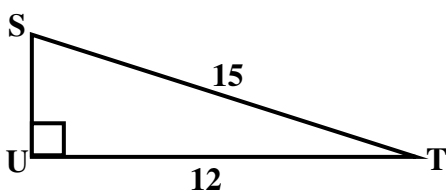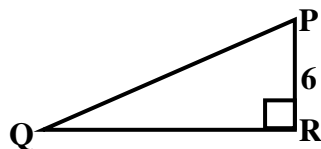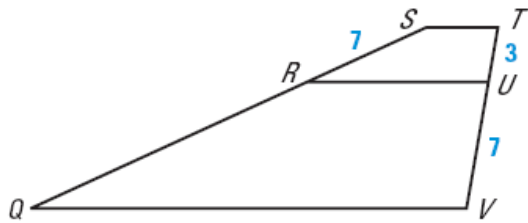
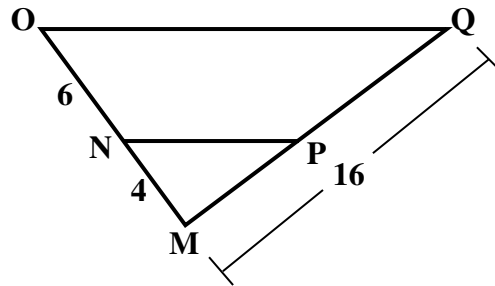**20.** Given $\dfrac{AB}{AC} = \dfrac{DE}{DF}$, find EF.

21. Given $\dfrac{JK}{KL} = \dfrac{JM}{MN}$, find JN.

**22.** Given $\dfrac{SQ}{SR} = \dfrac{TV}{TU}$, find RQ.

23. Given $\dfrac{MN}{NO} = \dfrac{MP}{PQ}$, find PQ.

24. In 2007, the exchange rate of Chinese yuans to American dollars was 8 to 1. When traveling to Hong Kong, Peter paid 384 yuans for a tour of the Great Wall of China. Note: It is the only man-made structure visible from space. Set up a proportion to determine how much Peter paid for the tour in American dollars.

25. A drawing is similar to the frame that surrounds it.
Determine the scale factor and set up a proportion using the scale factor
to find the width of the drawing in inches.
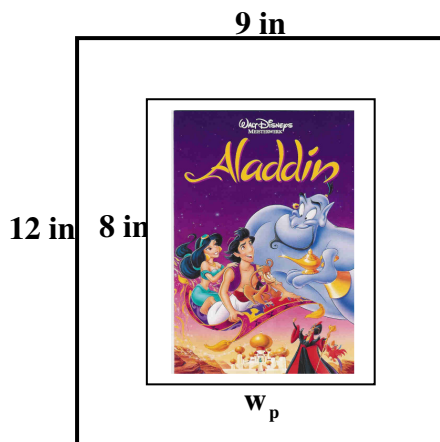
26. Write the statement of proportionality and all angle congruence statements based off of the following similarity statement, $\triangle ABC \sim \triangle DEF$.

27. If $\triangle PQR \sim \triangle STU$, which proportion is not necessarily true?

(A) $\dfrac{PQ}{PR} = \dfrac{ST}{SU}$

(B) $\dfrac{PR}{SU} = \dfrac{QR}{TU}$

(C) $\dfrac{PQ}{SU} = \dfrac{PR}{TU}$

(D) $\dfrac{PQ}{QR} = \dfrac{ST}{TU}$

28. Complete each statement or equation below.

a) $\triangle ABC \sim$ _____

b) $\dfrac{BA}{} = \dfrac{AC}{} = \dfrac{CB}{}$

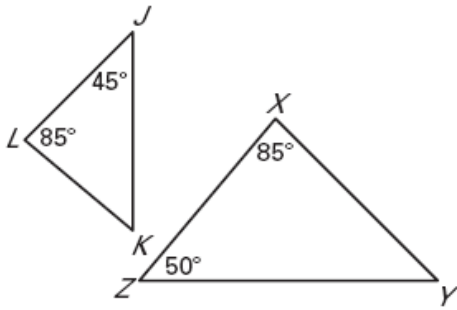c) $\dfrac{25}{} = \dfrac{}{12}$

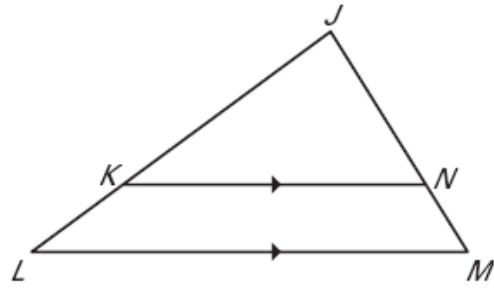d) $\dfrac{}{25} = \dfrac{18}{}$

e) $y =$ _____

f) $x =$ _____
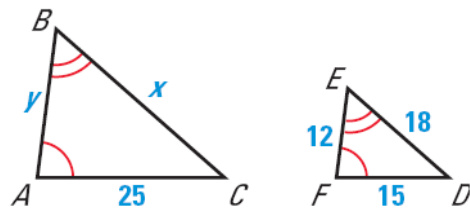
Determine whether the triangles can be proved similar. If they are, provide a reason by stating a shortcut. Otherwise, state why the triangles are not similar.
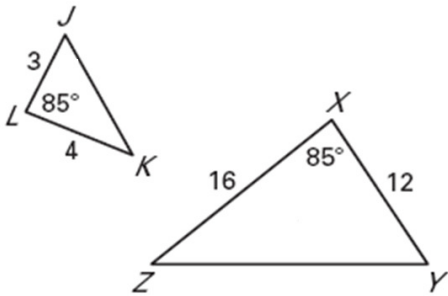
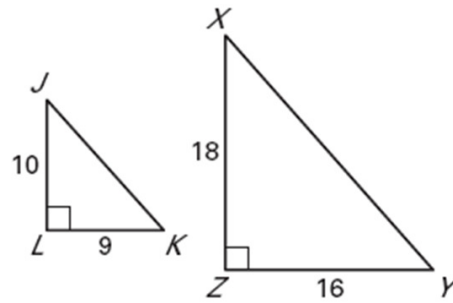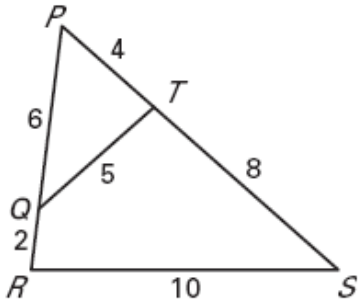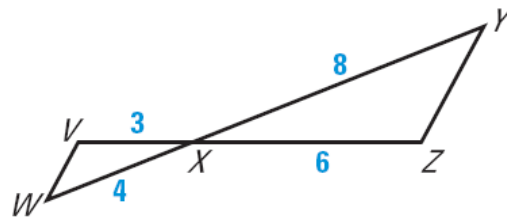**29.**

30.

31.

32.
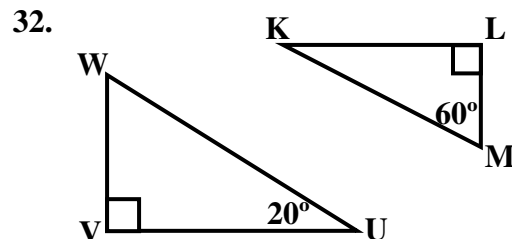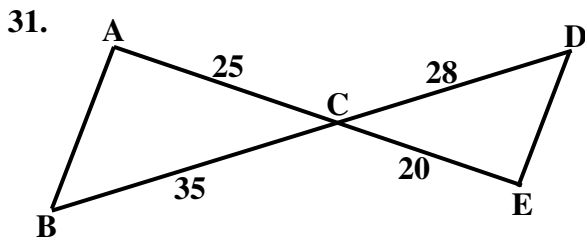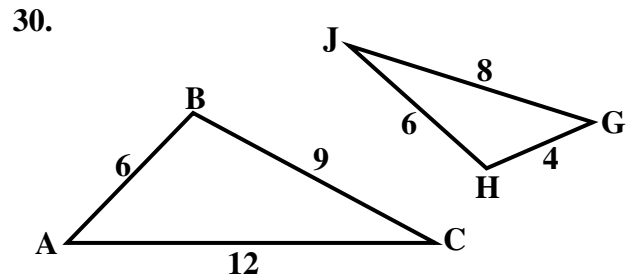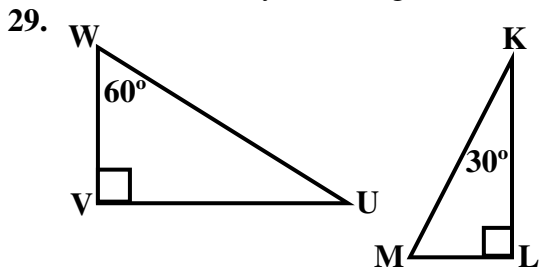
33.

34.
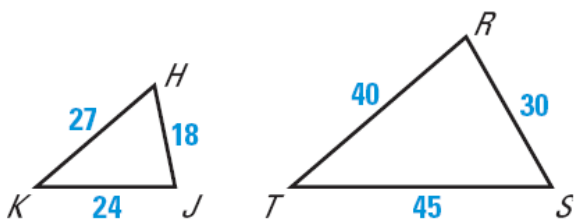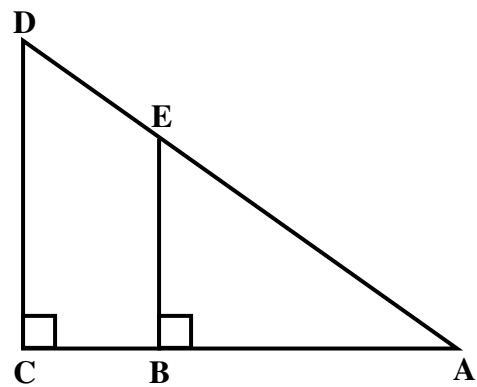

35.
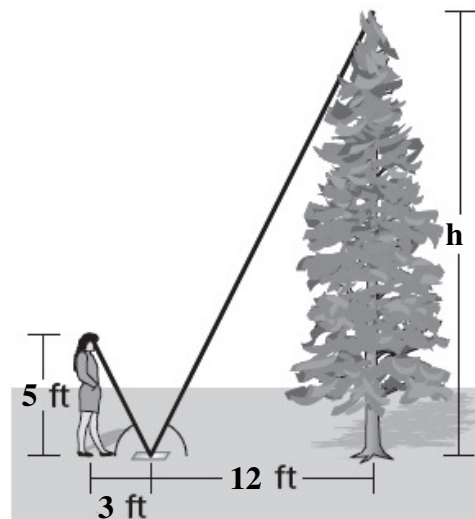

36.

37.

38.

39.

40.

41. Mirror and Similar Triangles In order to estimate the height of a tall pine tree, a student places a mirror on the ground and stands where she can see the top of the tree, as shown.
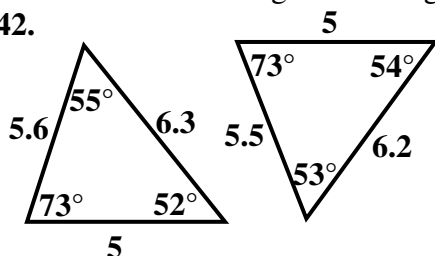
a) What shortcut can be used to show that the triangles are similar?
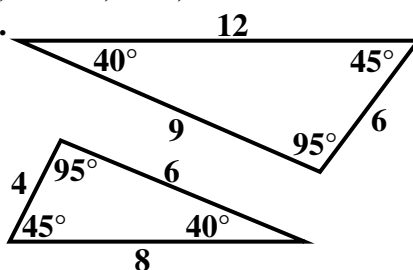
b) What is the height of the pine tree?

5 ft

3 ft

12 ft

h

Determine if the triangles are congruent, similar, both, or neither.

42.

55°
5.6   6.3
73°   52°
5

5
73°   54°
5.5   6.2
53°

43.

12
40°   45°
9
95°   6
4 95°   6
45°   40°
8

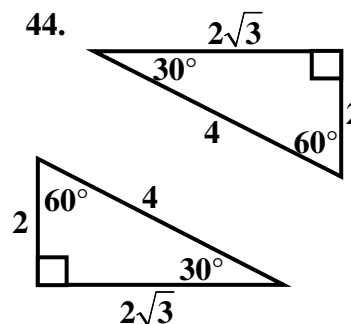**44.**

2√3
30°
4   60° 2

2
60°   4
30°
2√3

Answer Key:

1) third   2) shorter   3) ratio   4) proportion   5) cross multiply   6) simplify   7) congruent, ratios

8) scale factor   9) $\overline{AB}, \overline{BC}, \overline{AC}$ 10) ∠B, ∠A, ∠C   11) Yes   12) 18   13) D

14) w = 12 ft, ℓ = 30 ft   15) w = 9 cm, ℓ = 12 cm   16) 10°, 75°, 95°   17) 15°, 60°, 105°   18) 36 teeth

19) SU = 9, QR = 8, PQ = 10   20) $2\frac{4}{5}$ 21) $21\frac{3}{5}$ 22) $RQ = 16\frac{1}{3}$ 23) $PQ = 9\frac{3}{5}$ 24) 48 dollars

25) w = 6 in.   26) $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$, ∠A ≅ ∠D, ∠B ≅ ∠E, ∠C ≅ ∠F

27) C   28) a) ΔFED   b) $\frac{BA}{EF} = \frac{AC}{FD} = \frac{CB}{DE}$ c) $\frac{25}{15} = \frac{y}{12}$ d) $\frac{15}{25} = \frac{18}{x}$ e) y = 20   f) x = 30   29) Yes, by AA

30) Yes, by SSS   31) Yes, by SAS   32) No   33) Yes, by AA   34) Yes, by AA   35) Yes, by SAS   36) No

37) Yes, by SSS   38) Yes, by SAS   39) Yes, by SSS   40) Yes by AA   41) a) AA   b) h = 20 ft   42) Neither

43) Similar   44) Both