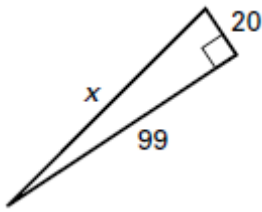
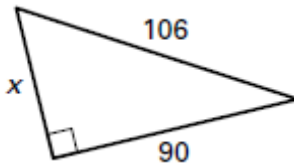


Find the unknown side length of the right triangle.

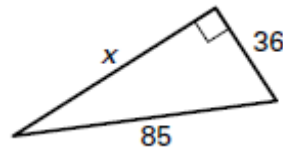
1.



2.



3.



Answers

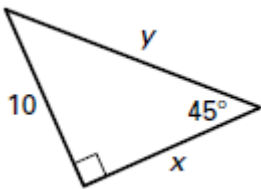
1. \_\_\_\_\_

2. \_\_\_\_\_

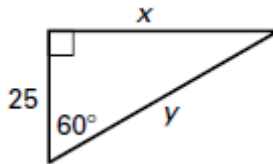
3. \_\_\_\_\_

Find the value of each variable. Write your answers in simplest radical form.

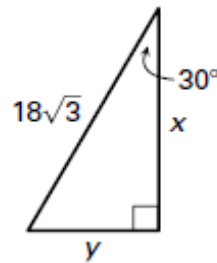
4.



5.



6.



4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

7. \_\_\_\_\_

8. \_\_\_\_\_

7. You are measuring the height of a Ferris wheel at an amusement park. You are standing 125 feet from its base. You measure the angle of elevation from a point on the ground to the top of the Ferris wheel to be  $51^\circ$ . Estimate the height of the Ferris wheel. Round your answer to the nearest foot.

9. \_\_\_\_\_

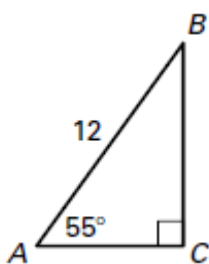
\_\_\_\_\_

10. \_\_\_\_\_

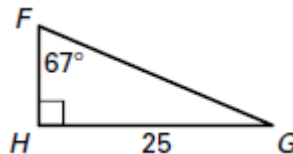
\_\_\_\_\_

Solve the right triangle. Round decimal answers to the nearest tenth.

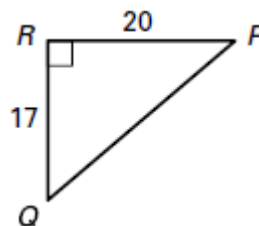
8.



9.



10.



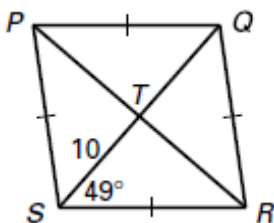
11. \_\_\_\_\_

12. \_\_\_\_\_

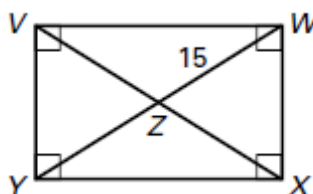
13. \_\_\_\_\_

Find the indicated measure.

11.  $m\angle PSQ$

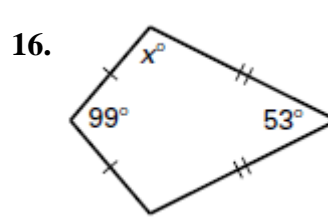
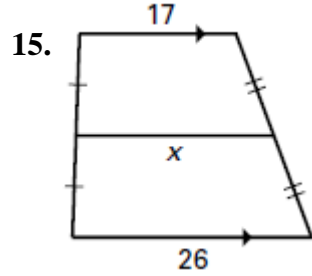
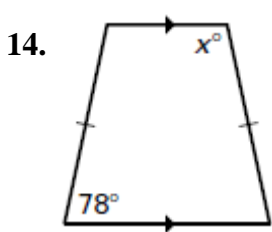


12.  $XV$



13. What are the measures of an interior angle and an exterior angle of a regular 30-gon?

Find the value of  $x$ .



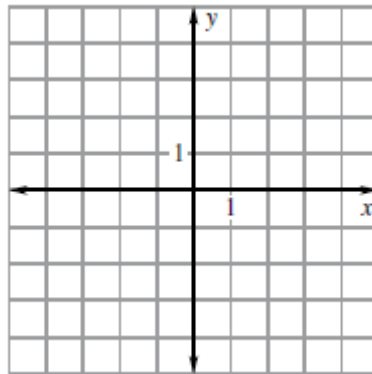
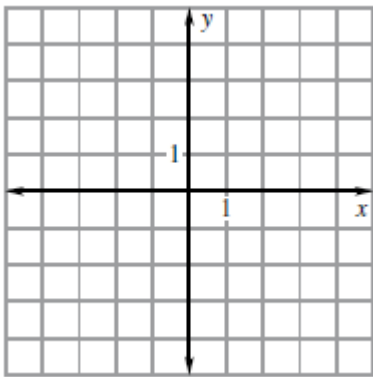
Answers

14. \_\_\_\_\_  
 15. \_\_\_\_\_  
 16. \_\_\_\_\_  
 17. \_\_\_\_\_  
 18. \_\_\_\_\_  
 19. \_\_\_\_\_

The vertices of  $\triangle XYZ$  are  $X(-1, 4)$ ,  $Y(3, 4)$ , and  $Z(2, 1)$ .  
 Translate  $\triangle XYZ$  using the given vector. Graph its image.

17.  $\langle -2, 0 \rangle$

18.  $\langle 1, -3 \rangle$



20. \_\_\_\_\_  
 21. \_\_\_\_\_  
 22. \_\_\_\_\_

Add, subtract, or multiply.

19.  $\begin{bmatrix} -4 & 7 \\ -2 & 12 \end{bmatrix} + \begin{bmatrix} 3 & -1 \\ -5 & -10 \end{bmatrix}$

20.  $\begin{bmatrix} 8 & -6 & 4 \end{bmatrix} - \begin{bmatrix} -7 & 2 & -3 \end{bmatrix}$

23. \_\_\_\_\_

21.  $\begin{bmatrix} 9 & 5 \end{bmatrix} \begin{bmatrix} -4 \\ 6 \end{bmatrix}$

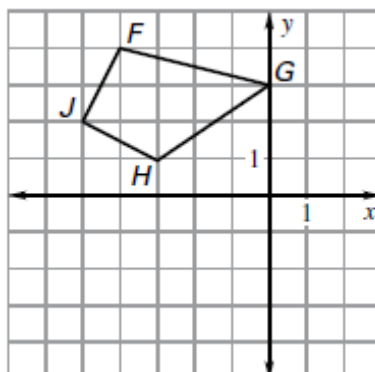
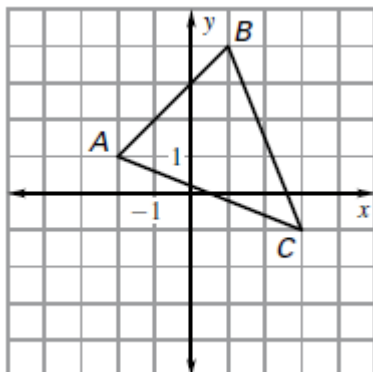
22.  $\begin{bmatrix} -1 & 6 \\ 5 & 1 \end{bmatrix} \begin{bmatrix} -4 & 2 \\ -2 & 0 \end{bmatrix}$

24. \_\_\_\_\_

Find the image matrix that represents the polygon after a reflection in the given line.

23.  $x$ -axis

24.  $y = -x$



The vertices of  $\triangle STU$  are  $S(1, -2)$ ,  $T(5, -2)$ , and  $U(1, -4)$ . Find the coordinates of the image of  $\triangle STU$  after a composition of the transformations in the order they are listed.

25. Translation:  $(x, y) \rightarrow (x - 1, y + 4)$   
 Reflection: in the  $y$ -axis

26. Translation:  $(x, y) \rightarrow (x - 3, y - 1)$   
 Rotation:  $90^\circ$  about the origin

25. \_\_\_\_\_

\_\_\_\_\_

26. \_\_\_\_\_

\_\_\_\_\_

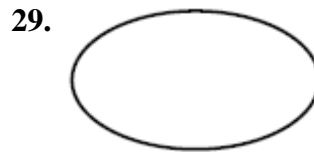
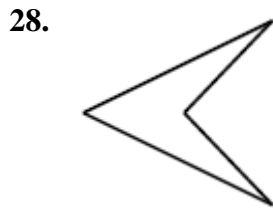
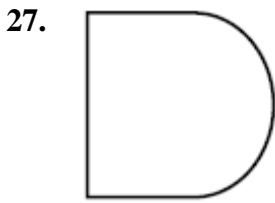
27. \_\_\_\_\_

\_\_\_\_\_

28. \_\_\_\_\_

\_\_\_\_\_

Decide whether the figure has *line symmetry* and/or *rotational symmetry*. Identify the number of lines of symmetry and/or the rotations that map the figure onto itself.



29. \_\_\_\_\_

\_\_\_\_\_

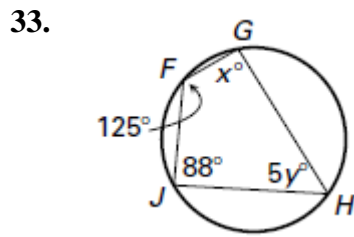
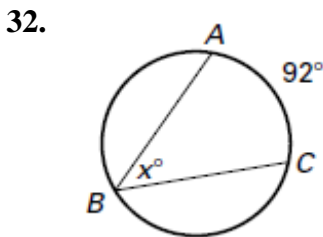
Find the image matrix that represents a dilation of the polygon centered at the origin with the given scale factor.

30.  $\begin{matrix} A & B & C \\ \begin{bmatrix} 1 & 3 & 0 \\ 6 & 2 & 4 \end{bmatrix}; k=2 \end{matrix}$

31.  $\begin{matrix} A & B & C \\ \begin{bmatrix} -8 & -4 & -8 \\ 4 & 4 & 0 \end{bmatrix}; k=\frac{3}{4} \end{matrix}$

30. \_\_\_\_\_

Find the value of each variable.



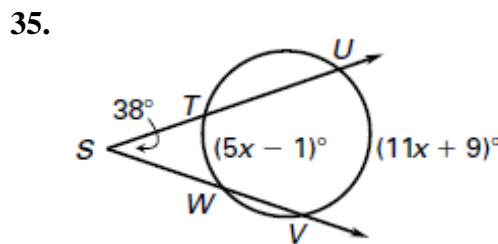
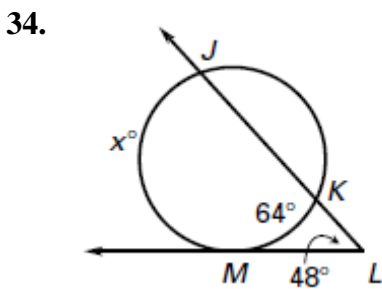
31. \_\_\_\_\_

32. \_\_\_\_\_

33. \_\_\_\_\_

34. \_\_\_\_\_

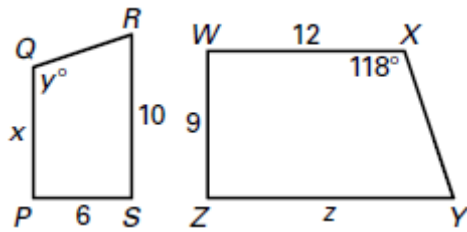
35. \_\_\_\_\_



In the diagram,  $PQRS \sim WXYZ$ .

36. Find the scale factor of  $PQRS$  to  $WXYZ$ .

37. Find the values of  $x$ ,  $y$ , and  $z$ .

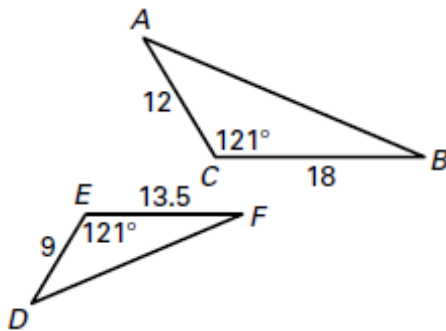


36. \_\_\_\_\_

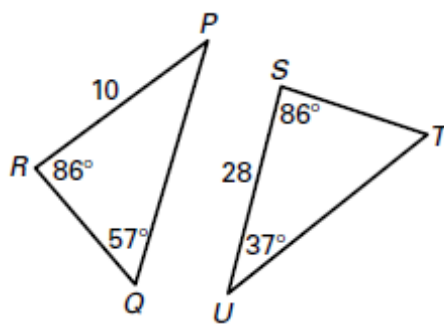
37. \_\_\_\_\_

Determine whether the two triangles are similar. If they are similar, write a similarity statement.

38.



39.



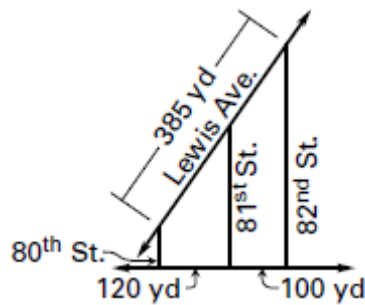
38. \_\_\_\_\_

39. \_\_\_\_\_

Using the map shown, find the given distance.

40. along Lewis Avenue from 80th Street to 81st Street

41. along Lewis Avenue from 81st Street to 82nd Street



40. \_\_\_\_\_

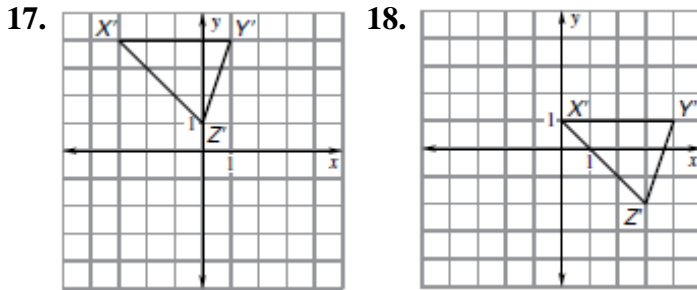
41. \_\_\_\_\_

42. A telephone pole casts a shadow that is 90 feet long. Mack, who is standing nearby, is 6 feet tall and casts a shadow that is 18 feet long. How tall is the telephone pole?

42. \_\_\_\_\_

## Answers

- 1.**  $x = 101$     **2.**  $x = 56$     **3.**  $x = 77$     **4.**  $x = 10$ ,  
 $y = 10\sqrt{2}$     **5.**  $x = 25\sqrt{3}$ ,  $y = 50$     **6.**  $x = 27$ ,  
 $y = 9\sqrt{3}$     **7.** 154 ft    **8.**  $m\angle B = 35^\circ$ ,  $AC \approx 6.9$ ,  
 $BC \approx 9.8$     **9.**  $m\angle G = 23^\circ$ ,  $FG \approx 27.2$ ,  
 $FH \approx 10.6$     **10.**  $m\angle P \approx 40.4^\circ$ ,  $m\angle Q \approx 49.6^\circ$ ,  
 $PQ \approx 26.2$     **11.**  $49^\circ$     **12.** 30 units    **13.**  $168^\circ$ ,  $12^\circ$   
**14.**  $x = 102$     **15.**  $x = 21.5$     **16.**  $x = 104$



**19.**  $\begin{bmatrix} -1 & 6 \\ -7 & 2 \end{bmatrix}$     **20.**  $[15 \quad -8 \quad 7]$     **21.**  $[-6]$

**22.**  $\begin{bmatrix} -8 & -2 \\ -22 & 10 \end{bmatrix}$     **23.**  $\begin{matrix} A' & B' & C' \\ \begin{bmatrix} -2 & 1 & 3 \\ -1 & -4 & 1 \end{bmatrix} \end{matrix}$

$F' \quad G' \quad H' \quad J'$   
**24.**  $\begin{bmatrix} -1 & -3 & -1 & -2 \\ 4 & 0 & 3 & 5 \end{bmatrix}$

**25.**  $S''(0, 2)$ ,  $T''(-4, 2)$ ,  $U''(0, 0)$

**26.**  $S''(3, -2)$ ,  $T''(3, 2)$ ,  $U''(5, -2)$

**27.** line symmetry; one line of symmetry

**28.** line symmetry; one line of symmetry

**29.** line symmetry, rotational symmetry; two lines of symmetry,  $180^\circ$  about the center

$A' \quad B' \quad C' \quad A' \quad B' \quad C'$   
**30.**  $\begin{bmatrix} 2 & 6 & 0 \\ 12 & 4 & 8 \end{bmatrix}$     **31.**  $\begin{bmatrix} -6 & -3 & -6 \\ 3 & 3 & 0 \end{bmatrix}$

**32.**  $x = 46$     **33.**  $x = 92$ ,  $y = 11$     **34.**  $x = 160$

**35.**  $x = 11$

**36.**  $\frac{2}{3}$     **37.**  $x = 8$ ,  $y = 118^\circ$ ,  $z = 15$

**38.** yes;  $\triangle ABC \sim \triangle DFE$

**39.** yes;  $\triangle PQR \sim \triangle UTS$     **40.** 210 yd

**41.** 175 yd    **42.** 30ft