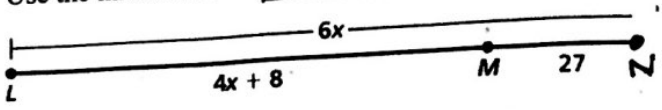
Name _____ Date _____

1. A map shows a section of Highway 18 that forms a straight line. A family plans to drive 480 miles on Highway 18 from Springfield to Columbia. They drive for 66 miles, and then decide they will stop halfway through their trip to rest for the night. How much farther do they need to drive before they stop for the night? $480 \div 2 = 240$, $240 - 66 = 174$

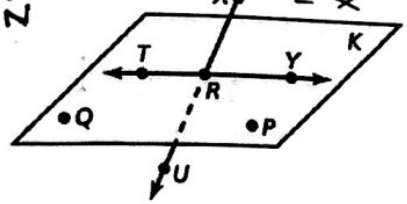
2. Point M is between points L and N on $\overline{LN}$. $LN = 6x$, $LM = 4x + 8$, and $MN = 31$. Use the information to solve for x, and then find LN.



$4x + 8 + 27 = 6x$
$-4x \quad -4x$
$35 = 2x$
$17.5 = x$

1. 174
$x = 17.5$
2. $LN = 105$

Use the diagram.



3. Give another name for line S.
ANSWERS MAY VARY
4. Give another name for plane K.
ANSWERS MAY VARY
5. The midpoint of $\overline{RS}$ is $M(2, 4)$. One endpoint is $R(-6, 6)$. Find the coordinates of endpoint S.

$\frac{x_1 + x_2}{2} = x_m$ $\quad \frac{y_1 + y_2}{2} = y_m$

$\frac{x + -6}{2} = 2$ $\quad \frac{y + 6}{2} = 4$

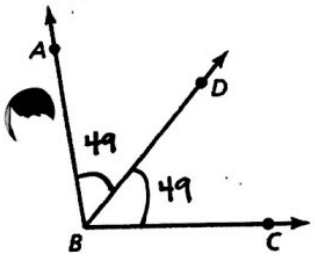
$x - 6 = 4$ $\quad y + 6 = 8$

$x = 10$ $\quad y = 2$

3. $\overleftrightarrow{XR}$ $\overleftrightarrow{XU}$ $\overleftrightarrow{UR}$
4. PLANE PTY
5. (10, 2)

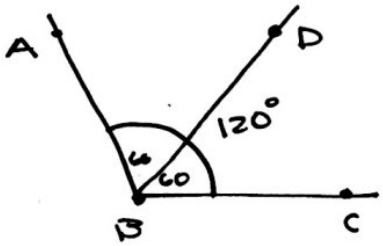
$\overline{BD}$ bisects $\angle ABC$. Use the diagram and the given angle measure to find the indicated angle measures.

bisects means cuts in two equal pieces



$49 \times 2 = 98$

6. $m\angle ABD = 49°$. Find $m\angle ABC$.



$120 \div 2 = 66$

7. $m\angle ABC = 120°$. Find $m\angle ABD$.

6. 98
7. 60
8. $182 - 3x$
9. 5
$x = 14$
10. $m\angle ABD = 59$
$m\angle DBC = 81$

Find the angle measure.

8. $\angle A$ is a supplement of $\angle B$ and $m\angle B = (3x - 2)°$. Find $m\angle A$.

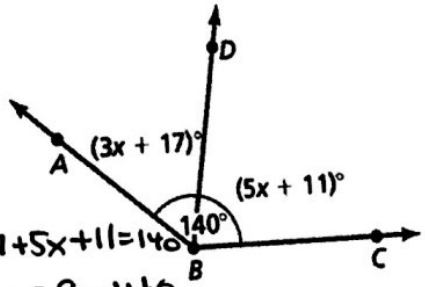
$= 180$

$m\angle A + m\angle B = 180$
$m\angle A + 3x - 2 = 180$
$+2 \quad +2$
$m\angle A + 3x = 182$
$-3x \quad -3x$

Solve the equation. Justify each step.

9. A gardener has 26 feet of fencing for a garden. To find the width of the rectangular garden, the gardener uses the formula $P = 2\ell + 2w$, where P is the perimeter, ℓ is the length, and w is the width of the rectangle. The gardener wants to fence a garden that is 8 feet long and plans on using all of the available fencing. How wide is the garden? Solve the equation for w, and justify each step.

10. Use the diagram to find the value of x and the measure of each angle.



9. P = 2ℓ + 2w
8 ft long
all available fencing means 26 ft perimeter
$26 = 2(8) + 2w$
$26 = 16 + 2w$
$-16 \quad -16$
$\frac{10}{2} = \frac{2w}{2}$
$5 = w$

$3x + 17 + 5x + 11 = 140$
$8x + 28 = 140$
$8x = 112$
$x = 14$

Identify the property that justifies each statement.

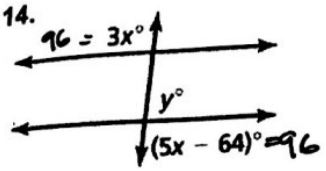
11. If $m\angle ABC = m\angle DEF$, then $m\angle DEF = m\angle ABC$. SYMMETRIC

12. If $AB = CD$ and $CD = EF$, then $AB = EF$. TRANSITIVE

13. $W = W$ REFLEXIVE

Find the values of *x* and *y*.

14.

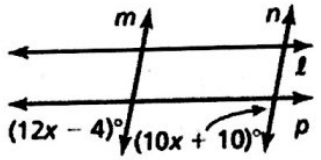


$3x = 5x - 64$
$-5x \quad -5x$
$-2x = -64$
$\frac{-2x}{-2} = \frac{-64}{-2}$
$x = 32$

$96 + y = 180$
$-96 \quad -96$
$y = 84$

Find the value of *x* that makes $m \parallel n$.

15.



$12x - 4 = 10x + 10$
$-10x + 4 \quad -10x + 4$
$2x = 14$
$x = 7$

Complete the sentence.

16. The slopes of perpendicular lines are _____.

17. Parallel lines have the _____ slope.

Write the equation of the line passing through the given point that is parallel to the given line.

18. $y = \frac{2}{3}x - 2$; $(-3, 4)$

$m = \frac{2}{3}$ $\quad y - y_1 = m(x - x_1)$
$y - 4 = \frac{2}{3}(x - -3)$
$y - 4 = \frac{2}{3}x + 2$
$+4 \quad +4$
$y = \frac{2}{3}x + 6$

Write the equation of the line passing through the given point that is perpendicular to the given line.

19. $y = \frac{2}{3}x - 2$; $(-2, 4)$

$m = -\frac{3}{2}$ $\quad y - y_1 = m(x - x_1)$
$y - 4 = -\frac{3}{2}(x - -2)$
$y - 4 = -\frac{3}{2}x - 3$
$+4 \quad +4$
$y = -\frac{3}{2}x + 1$

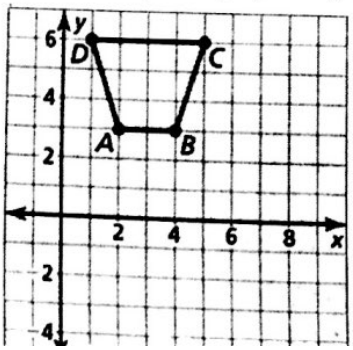
Determine if the lines are *parallel, perpendicular or neither*.

20. Line *a*: $y = 5x - 6$
Line *b*: $x + 5y = 5$
$-x \quad -x$

$y = 5x - 6$
$\frac{5y}{5} = \frac{-x}{5} + \frac{5}{5}$
$y = -\frac{1}{5}x + 1$

Use the given translation to find the coordinates of the image of quadrilateral ABCD.

21. $(x, y) \rightarrow (x + 4), (y - 5)$



A $(2, 3)$ $+4 \; -5$ $\rightarrow$ $6, -2$

B $(4, 3)$ $+4 \; -5$ $\rightarrow$ $8, -2$

C $(5, 6)$ $+4 \; -5$ $\rightarrow$ $9, 1$

D $(1, 6)$ $+4 \; -5$ $\rightarrow$ $5, 1$

11. _____

11. _____

12. _____

14 X = 32

Y = 84

15. 7

OPPOSITE

16. RECIPROCAL

17 Same

18. $y = \frac{2}{3}x + 6$

19 $y = -\frac{3}{2}x + 1$

20 perpen

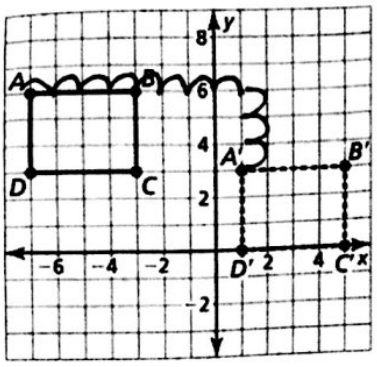
21 A' (6, -2)

B' (8, -2)

C' (9, 1)

D' (5, 1)

Write a rule for the translation of the preimage to the image. (Describe the transformation (or combination of transformations) that must take place.

22. 

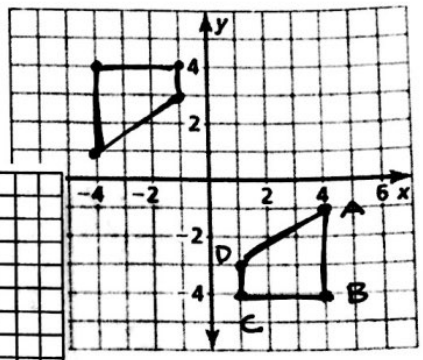
FROM A → A'
RIGHT 8
DOWN 3

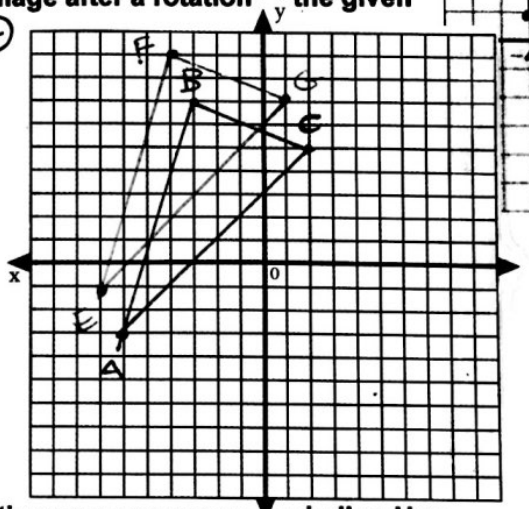
22 (x+8, y−3)

Graph the polygon with the given vertices and its image after a rotation of the given number of degrees clockwise about the origin. (24)

23. $A(4, -1), B(4, -4), C(1, -4), D(1, -3)$; 180°

A'(-4, 1)
B'(-4, 4)
C'(-1, 4)
D'(-1, 3)





Determine whether the polygons with the given vertices are congruent or similar. Use transformations to explain your reasoning.

24. $A(-6, -3), B(-3, 7), C(2, 5)$ and $E(-7, -1), F(-4, 9), G(1, 7)$

24 congruent

translated
$\overline{FG} \cong \overline{BC}$
$\overline{EF} \cong \overline{AB}$
$\overline{EG} \cong \overline{AC}$

Determine whether the object has line symmetry and whether it has rotational symmetry. Identify all lines of symmetry and angles of rotation that map the figure into itself.

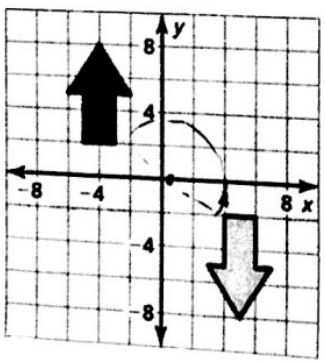
25. 

25. Line? yes

Rot? no

26. OMIT

Describe a (one) congruence transformation that maps the black preimage to the grey image.

26. 

rotates around point (not origin). did not discuss in lesson...

27. Triangle ABC with vertices $A(-2, 5)$, $B(1, 8)$, $C(7, 5)$ is dilated using a scale factor of $\frac{1}{2}$. What are the coordinates of the image of triangle ABC?

27 A' $(-1, \frac{5}{2})$

B' $(\frac{1}{2}, 4)$

C' $(\frac{7}{2}, \frac{5}{2})$

Find the measure of the angle(s).

28.

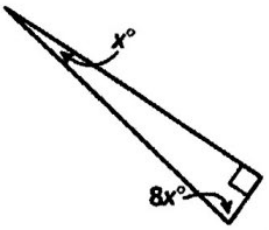
$5x - 2 = 2x + 76$

$-2x + 2 \quad -2x + 2$

$3x = 78$

$x = 26$

29.



$x + 8x + 90 = 180$

$9x = 90$

$x = 10$

X = 26

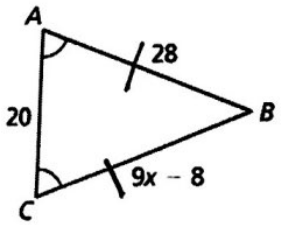
Angles = 50, 52

X = 10

Angles = 10, 80

Find the value of *x*.

30.



$28 = 9x - 8$

$+8 \qquad +8$

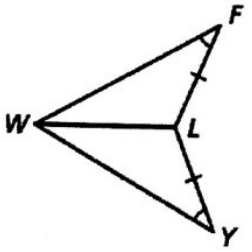
$\frac{36}{9} = \frac{9x}{9}$

$4 = x$

30. 4

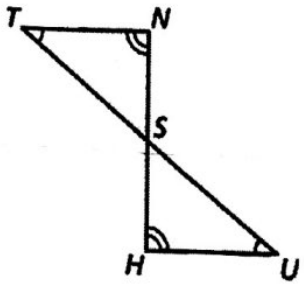
Decide whether the triangles can be proven congruent by the given postulate or theorem. If not, state what information is needed.

31. $\Delta FLW \cong \Delta YLW$ by SAS



31 NO, THE INCLUDED ANGLE OR ~~SEGMENT~~ FW & YW WOULD NEED TO BE ~~≅~~

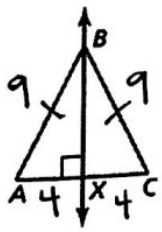
32. $\Delta TNS \cong \Delta UHS$ by HL



32. NO. THERE IS NO RT ∠ THEREFORE NO HYPOTENUSE

Find the length of *AC*.

33. $AB = 9$, $AX = 4$, and $BC = 9$



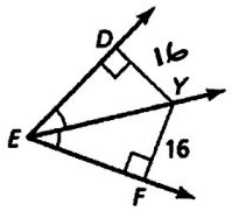
4 + 4 = 8

33. 8

34. 16

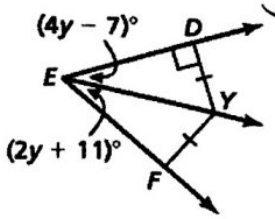
Find the indicated measure.

34. *DY*



$\overrightarrow{EY}$ is $\angle BIS$.

35. $m\angle DEF$



$4y - 7 = 2y + 11$

$-2y + 7 \quad -2y + 7$

$2y = 18$

$y = 9$

$4(9) - 7$

$36 - 7$

29

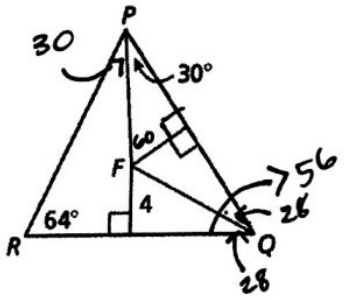
35. Y = 9

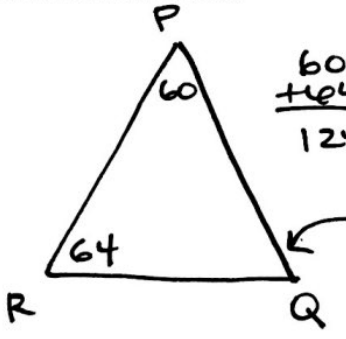
$m\angle DEF$ 29

36 28

$\overline{PF}$ and $\overline{QF}$ are angle bisectors of $\triangle PQR$. Find the indicated measure.

36. $m\angle FQP$





$60 + 64 = 124$

$180 - 124 = 56$

$56 \div 2 = 28$

37 OMIT

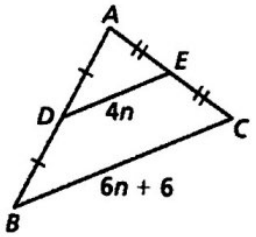
38 OMIT

39. OMIT

40 OMIT

$\overline{DE}$ is a midsegment of $\triangle ABC$. Find the value of *n*.

37.



Describe the possible lengths of the third side of the triangle given the lengths of the other two sides.

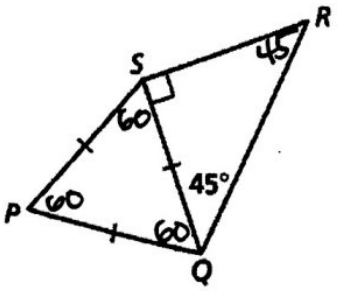
38. 5yd, 24 yd

List the angles of $\triangle DEF$ in order from least to greatest.

39. $D(-2, -3)$, $E(6, 3)$, $F(-2, 8)$

Copy and complete the statement with <, >, or =.

40. PS ___ RS



$SQ \cong SP \cong PQ \cong RS$