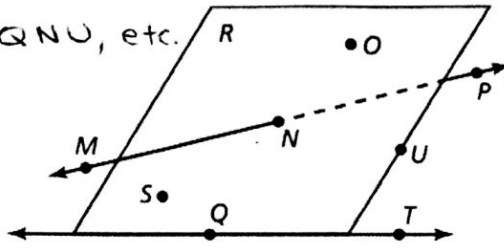
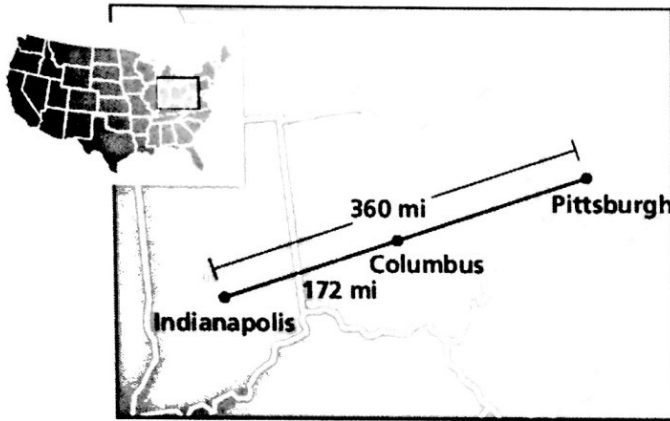


Use the figure.

1. Give another name for plane R. $SOU, SNU, QNU, \text{etc.}$
2. Name a line that intersects the plane. \overleftrightarrow{MP}
3. Name two rays. $\overrightarrow{MN}, \overrightarrow{NP}, \overrightarrow{NM}, \overrightarrow{QT}$
4. Name a point on plane R. S, N, O, U, Q



5. The cities shown on the map lie approximately in a straight line. Find the distance from Pittsburgh, Pennsylvania, to Columbus, Ohio.



$$\begin{array}{r} 360 \\ -172 \\ \hline 188 \end{array}$$

The endpoints of \overline{AB} are given. Find the coordinates of the midpoint C.

6. $A(-1, 9)$ and $B(-2, 5)$ $(-\frac{3}{2}, 7)$
7. $A(12, -5)$ and $B(-3, 2)$ $(\frac{9}{2}, -\frac{3}{2})$

$$\textcircled{6} \begin{pmatrix} -1 & 9 \\ -2 & 5 \end{pmatrix} \rightarrow \begin{pmatrix} -\frac{3}{2} & 14 \\ 2 & 2 \end{pmatrix}$$

$$\textcircled{7} \begin{pmatrix} 12 & -5 \\ -3 & 2 \end{pmatrix} \rightarrow \begin{pmatrix} \frac{9}{2} & -\frac{3}{2} \end{pmatrix}$$

The midpoint M and one endpoint of \overline{CE} are given. Find the coordinates of the other endpoint.



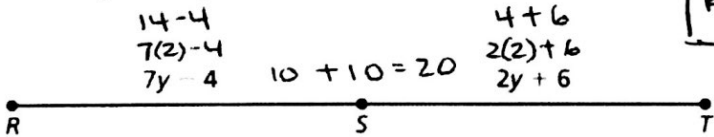
8. $M(\frac{5}{2}, 1)$ and $E(-2, -3)$ $(7, 5)$
9. $M(-1, 3)$ and $C(-4, 1)$ $(2, 5)$

$$\textcircled{8} \begin{cases} -2+x = \frac{5}{2} \\ -3+y = 1 \end{cases}$$

$$\begin{array}{r} -2+x = \frac{5}{2} \\ +2 \\ \hline x = 7 \end{array} \quad \begin{array}{r} -3+y = 1 \\ +3 \\ \hline y = 5 \end{array}$$

10. Identify the segment bisector of \overline{RT} . Then find RT .

$$\boxed{RT=20}$$

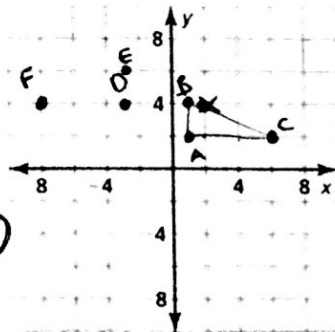


$$\begin{array}{l} \text{POINT S} \\ 7y-4 = 2y+6 \\ -2y+4 = -2y+6 \\ 5y = 10 \\ y = 2 \end{array}$$

11. a. Plot the points in the coordinate plane.

$A(1, 2), B(1, 4), C(6, 2)$ $\triangle ABC$ $\frac{1}{2}(5)(2)$

$D(-3, 4), E(-3, 6), F(-8, 4)$ $\triangle DEF$ $\frac{1}{2}(5)(2)$



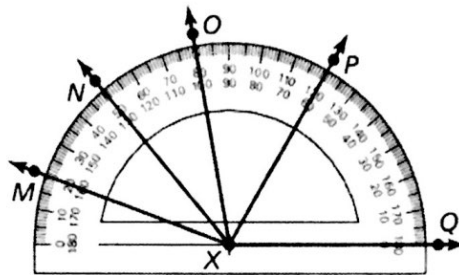
- b. Find the area of each triangle. $\frac{1}{2}(5)(2) = \frac{1}{2}(10) = 5$

- c. Do the triangles have the same area? Explain.

YES. BOTH HAVE A BASE OF 5 & A HEIGHT OF ONE THUS BRINGING BOTH AREAS TO 5.

Find the angle measure. Then classify the angle.

12. $m\angle MXN$ $50 - 20 = 30$ ACUTE
 13. $m\angle NXP$ $120 - 50 = 70$ ACUTE
 14. $m\angle OXQ$ $180 - 80 = 100$ OBTUSE



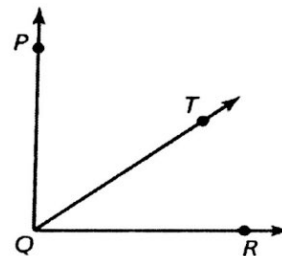
Use the diagram and the given angle measures to find the indicated angle measure.

15. $m\angle PQT = 51.5^\circ$ and $m\angle TQR = 48^\circ$. Find $m\angle PQR$.

$$\begin{array}{r} 51.5 \\ + 48 \\ \hline 99.5 \end{array}$$

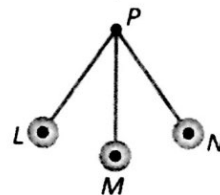
16. $m\angle PQR = 113^\circ$ and $m\angle TQR = 30.25^\circ$. Find $m\angle PQT$.

$$\begin{array}{r} 113.00 \\ - 30.25 \\ \hline 82.75 \end{array}$$



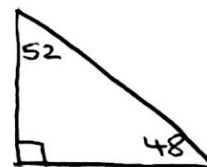
17. The tip of a pendulum is in a state of rest, hanging from point P. During an experiment, a physics student sets the pendulum in motion. The tip of the pendulum swings back and forth. The tip swings from point L to point N. During each swing, the tip passes through point M. Name all the angles in the diagram.

$\angle LPM$ or $\angle MPL$
 $\angle MPN$ or $\angle NPM$
 $\angle LPN$ or $\angle NPL$



18. Your friend is making a pattern for quilt pieces. Her pattern is a right triangle with two acute angles that are complementary. The measure of one of the acute angles is to be 12° more than half the measure of the other acute angle. Find the measure of each angle of the triangle.

$$\begin{array}{l} x + 12 + \frac{1}{2}x = 90 \\ 1.5x + 12 = 90 \\ \frac{1.5x}{1.5} = \frac{78}{1.5} \\ x = 52 \end{array}$$



Write the if-then form of the conditional statement.

19. It is time for dinner if it is 6 P.M.
 IF IT IS 6 P.M., THEN IT IS TIME FOR DINNER

20. The measure of a right angle is 90° .
 IF AN ANGLE IS A RIGHT ANGLE, THEN IT MEASURES 90° .

Write the converse of the conditional statement. If the converse is false, provide a counterexample.

21. If two angles are not adjacent, then they are vertical angles.
 IF TWO ANGLES ARE VERTICAL ANGLES, THEN THEY ARE NOT ADJACENT.
 CONVERSE TRUE.
22. If x is odd, then $3x$ is odd.
 IF $3x$ IS ODD, THEN x IS ODD — CONVERSE TRUE

Write the inverse of the conditional statement.

23. If an angle measures 30° , then it is acute.
 IF THE MEASURE OF AN ANGLE IS NOT 30° , THEN IT IS NOT ACUTE
24. If two angles are supplementary, then their sum is 180° .
 IF TWO ANGLES ARE NOT SUPPLEMENTARY, THEN THEIR SUM IS NOT 180° .

Write the contrapositive of the conditional statement.

25. If an animal is a panther, then it lives in the forest.
 IF AN ANIMAL DOES NOT LIVE IN THE FOREST, THEN IT IS NOT A PANTHER.
26. If two angles have the same measure, then they are congruent.
 IF TWO ANGLES ARE NOT CONGRUENT, THEN THEY DO NOT HAVE THE SAME MEASURE.

Find the values of x and y. State which theorem(s) you used. CORRESPONDING

$$\begin{aligned} 5x &= 3x + 50 && \text{ALT EXT} \\ 2x &= 50 \\ x &= 25 \end{aligned}$$

41. ~~scribble~~

$$\begin{aligned} 3x + 45 &= 180 \\ 3x &= 135 \\ x &= 45 \end{aligned}$$

SUPP \angle s

$$\begin{aligned} 45 &= y - 4 \\ +4 & \quad +4 \\ \hline 49 &= y \end{aligned}$$

CORRESPOND \angle s

42. $3x + 23 = 4x$
 $23 = x$

$x = 23$

SUPP \angle s

$$\begin{aligned} y + 4(23) &= 180 \\ y + 92 &= 180 \\ y &= 88 \end{aligned}$$

43.

VERT \angle s

$$\begin{aligned} y + 12 &= 5(25) \\ y + 12 &= 125 \\ y &= 113 \end{aligned}$$

44. When two parallel lines are cut by a transversal, name the angles that are congruent. ALT INT, ALT EXT, CORRESPONDING

45. When two parallel lines are cut by a transversal, name the angles that are supplementary. CONS. INT.

Find the value of x that makes line $m \parallel n$. (m parallel to n)

46. $2x = 90$
 $x = 45$

47. $3x + 47 + x + 7 = 180$
 $4x + 54 = 180$

$$\begin{aligned} 4x &= 126 \\ \frac{4x}{4} &= \frac{126}{4} \\ x &= 31.5 \end{aligned}$$

48. $5x = 2x + 78$
 $3x = 78$
 $x = 26$

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

49. $y = \frac{1}{2}x - 2.5$
Point: $(-3, -4)$
 $y - (-4) = \frac{1}{2}(x - (-3))$
 $y + 4 = \frac{1}{2}x + \frac{3}{2}$
 $m = \frac{1}{2}$

50. $(3, 6)$
 $y - 6 = \frac{1}{3}(x - 3)$
 $y - 6 = \frac{1}{3}x - 1$
 $y = \frac{1}{3}x + 5$

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

51. $y = \frac{1}{2}x - 4$
Point: $(4, -2)$
 $y - (-2) = -2(x - 4)$
 $y + 2 = -2x + 8$
 $m = -2$

52. $(2, 3)$
 $y - 3 = -\frac{3}{2}(x - 2)$
 $y - 3 = -\frac{3}{2}x + 3$
 $y = -\frac{3}{2}x + 6$

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

53. $y = 3x - 5$; $y = -3x + 1$
 $m = 3$; $m = -3$

54. $2x + 3y = 15$; $4x + 6y = -48 - 4x$
 $m = -\frac{2}{3}$; $m = -\frac{2}{3}$

55. $6x - 12y = -24$; $3y = \frac{2}{3}x + 18$
 $-12y = -24 - 6x$
 $-12y = -6x - 24$
 $-2y = -x - 4$
 $y = \frac{1}{2}x + 2$

56. $4x + 2y = 10$; $y = \frac{1}{2}x + 15$
 $2y = -4x + 10$
 $y = -2x + 5$
 $m = \frac{1}{2}$

Use the coordinate plane diagram.

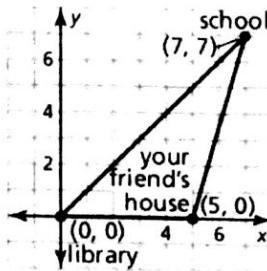
57. What is the distance from your friend's house to the school?

$(5, 0)$ $(7, 7)$

$$d = \sqrt{(7-5)^2 + (7-0)^2}$$

$$= \sqrt{2^2 + 7^2}$$

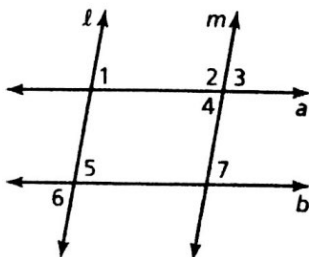
$$= \sqrt{4 + 49} = \sqrt{53} = 7.28$$



Write a two-column proof.

58. Given $l \parallel m$ and $\angle 1 \cong \angle 7$ to $\angle 2$.

Prove $a \parallel b$



59. Given $a \parallel b$ and $\angle 5$ is supplementary

Prove $l \parallel m$

