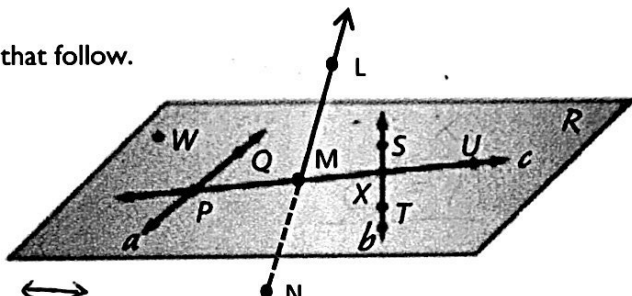


Directions: Use the figure to the right to answer the questions that follow.



1) Name three collinear points.

• P, M, X, U or • L, M, N

2) Name two non-coplanar points to plane R.

• L and • N

3) Name line b in a different way.

4) Name plane R in a different way.

plane WQP, PQM, SMX, UST, any combination of 3 coplanar noncollinear points.

5) $\angle TXU \cap c = \overrightarrow{XU}$

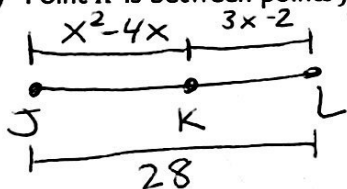
6) $\overline{PQ} \cap \overline{UX} = \bullet P$

7) $\overline{XT} \cup \overline{XU} = \angle UXT$

8) $\overline{UP} \cap \overline{PQ} = \bullet P$

Directions: Answer each free response question.

9) Point K is between points J and L. If $JK = x^2 - 4x$, $KL = 3x - 2$, and $JL = 28$, find JK.



$JK = 12$

$x^2 - 4x + 3x - 2 = 28$

$x^2 - x - 2 = 28$

$x^2 - x - 30 = 0$

$(x - 6)(x + 5) = 0$

$x = 6$ ~~$x = -5$~~

~~$\begin{matrix} -30 \\ -6 \times 5 \\ -1 \end{matrix}$~~

10) Find the coordinates of B if B is the midpoint of \overline{AC} and C is the midpoint of \overline{AD} .

Find C first $(\frac{6+4}{2}, \frac{11+5}{2})$

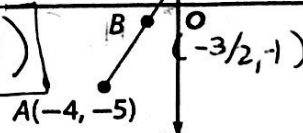
$(\frac{2}{2}, \frac{6}{2})$

$(= (1, 3))$

Then $(\frac{1+4}{2}, \frac{3+5}{2})$

$(\frac{-3}{2}, \frac{-2}{2})$

$B = (-\frac{3}{2}, -1)$



11) Determine the value of n given $J(n, n + 2)$, $K(3n, n - 1)$, and $JK = 5$.

$(n, n+2)$ $(3n, n+1)$



$n = \pm 2$

distance is 5 so use the distance formula

$d = \sqrt{(\Delta x)^2 + (\Delta y)^2}$

$5 = \sqrt{(3n-n)^2 + (n-1-(n+2))^2}$

$5 = \sqrt{(2n)^2 + (-3)^2}$

$(5)^2 = (\sqrt{4n^2 + 9})^2$

$25 = 4n^2 + 9$

$25 = 4n^2 + 9$

$\frac{16}{4} = \frac{4n^2}{4}$

$4 = n^2$
 $\pm 2 = n$

12) Given: $AB = 2x + 25$, $AC = -6x - 6$, $BC = -x + 16$, and $\overline{AB} \cong \overline{BC}$ find the perimeter of the triangle.

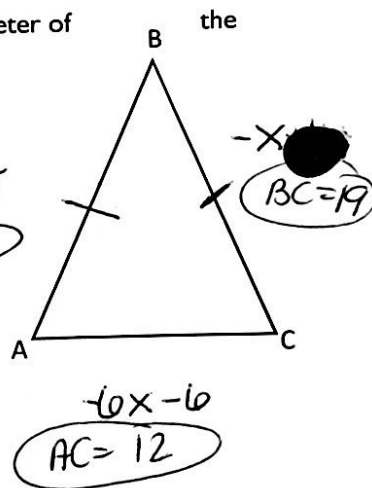
$$2x + 25 = -x + 16$$

$$3x = -9$$

$$x = -3$$

Perimeter = $19 + 19 + 12 = 50$

$2x + 25$
 $AB = 19$



13) Given:

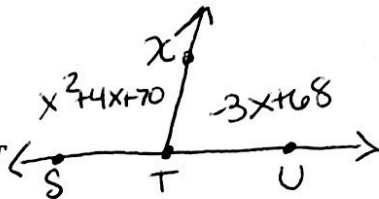
$\angle STU$ is a straight angle

\overline{TX} intersects $\angle STU$ at point T

$m\angle STX = (x^2 + 4x + 70)^\circ$

$m\angle UTX = (-3x + 68)^\circ$

Find the possible value(s) for $m\angle STX$.



$$\begin{array}{r} +7 \quad -42 \\ \times \quad -6 \\ \hline 1 \end{array}$$

$$x^2 + 4x + 70 - 3x + 68 = 180$$

$$x^2 + x + 138 = 180$$

$$x^2 + x - 42 = 0$$

$$(x + 7)(x - 6) = 0$$

$x = -7$ $x = 6$

* Both work!

$$x^2 + 4x + 70 = m\angle STX$$

$$(-7)^2 + 4(-7) + 70 = 91^\circ$$

$$(6)^2 + 4(6) + 70 = 130^\circ$$

14) Find the distance and the midpoint of BC given $B(-1, 1)$ and $C(6, -9)$.

$$d = \sqrt{(-7)^2 + (10)^2}$$

$$\sqrt{49 + 100}$$

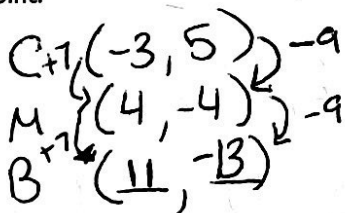
$$\sqrt{149}$$

midpoint $\left(\frac{-1+6}{2}, \frac{1-9}{2}\right)$
 $\left(\frac{5}{2}, \frac{-8}{2}\right)$

$d = \sqrt{149}$

Midpoint: $\left(\frac{5}{2}, -4\right)$

15) Find point B of BC given $C(-3, 5)$ and $M(4, -4)$ is the midpoint of BC then find the distance M is to each endpoint.



$$d = \sqrt{(7)^2 + (-9)^2}$$

$$\sqrt{49 + 81}$$

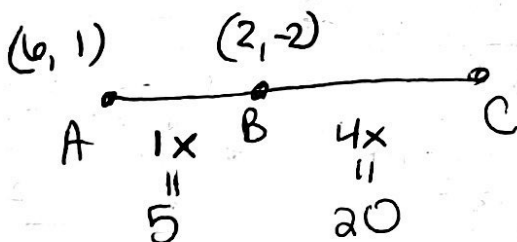
$$\sqrt{130}$$

$$\sqrt{130} = \sqrt{13 \cdot 10} = \sqrt{13} \cdot \sqrt{10} = \sqrt{13} \cdot \sqrt{2} \cdot \sqrt{5}$$

$B = (11, -13)$

$d = \sqrt{130}$

16) Given points A , B , and C are collinear on the coordinate plane with $A(6, 1)$ and $B(2, -2)$ and AB is one-fourth the length of BC , find BC .



$$AB = \sqrt{4^2 + 3^2}$$

$$\sqrt{16 + 9}$$

$$\sqrt{25}$$

$$AB = 5$$

$BC = 20$