

Name:

Date:

PARTITIONING DIRECTED LINE SEGMENTS

- Steps to Partitioning a Line Segment: (Directed Line Segments-Order Matters!)
1. Find change in x and change in y.
 2. Multiply changes by the ratio (as a fraction).
 3. Add the changes to the original x and y values.

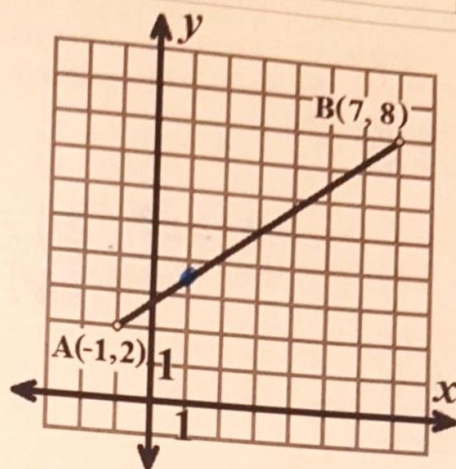
- ① Given points $A(-1, 2)$ and $B(7, 8)$, find the coordinates of the point on directed line segment AB that partitions AB in the ratio $1:3$. Show work. Graph the point.

$$1:3 = \frac{1}{4}$$

$$\Delta x = x_2 - x_1 = 7 - (-1) = 8 \left(\frac{1}{4}\right) = 2$$

$$\Delta y = y_2 - y_1 = 8 - 2 = 6 \left(\frac{1}{4}\right) = \frac{6}{4} = 1.5$$

$$\begin{array}{r} A(-1, 2) \\ +2, 1.5 \\ \hline (1, 3.5) \end{array}$$



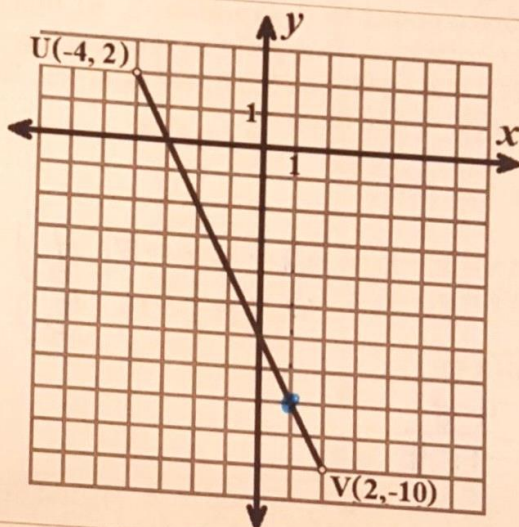
- ② Given points $V(2, -10)$ and $U(-4, 2)$, find the coordinates of the point on directed line segment VU that partitions VU in the ratio $1:5$. Show work. Graph the point.

$$1:5 = \frac{1}{6}$$

$$\Delta x = x_2 - x_1 = -4 - 2 = -6 \left(\frac{1}{6}\right) = -1$$

$$\Delta y = y_2 - y_1 = 2 - (-10) = 12 \left(\frac{1}{6}\right) = 2$$

$$\begin{array}{r} V(2, -10) \\ -1, +2 \\ \hline (1, -8) \end{array}$$



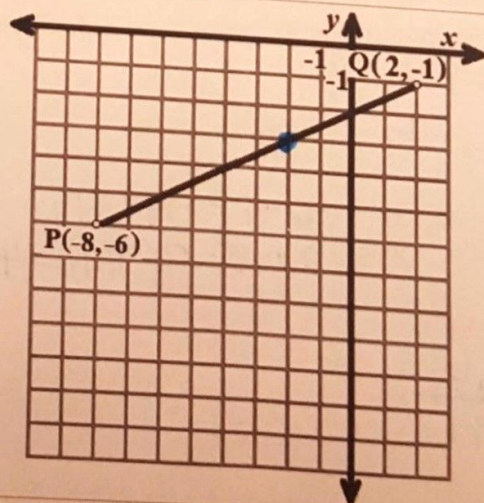
- ③ Given points $Q(2, -1)$ and $P(-8, -6)$, find the coordinates of the point on directed line segment QP that partitions QP in the ratio $2:3$. Show work. Graph the point.

$$2:3 = \frac{2}{5}$$

$$\Delta x = x_2 - x_1 = -8 - 2 = -10 \left(\frac{2}{5}\right) = -4$$

$$\Delta y = y_2 - y_1 = -6 - (-1) = -5 \left(\frac{2}{5}\right) = -2$$

$$\begin{array}{r} Q(2, -1) \\ -4, -2 \\ \hline (-2, -3) \end{array}$$



- ④ Given points D(3, -12) and C(-5, 4), find the coordinates of the point on directed line segment DC that partitions DC in the ratio 3:5. Show work. Graph the point.

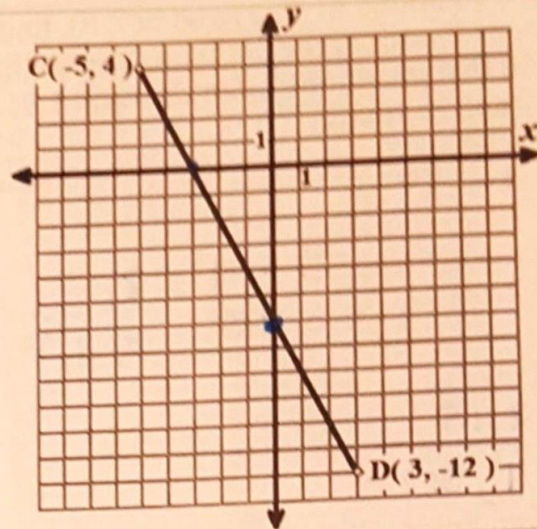
$$3:5 = \frac{3}{8}$$

$$\Delta x = x_2 - x_1 = -5 - 3 = -8 \left(\frac{3}{8}\right) = -3$$

$$\Delta y = y_2 - y_1 = 4 - (-12) = 16 \left(\frac{3}{8}\right) = 6$$

$$D(3, -12)$$

$$\begin{array}{r} -3 \ 6 \\ \hline 0, \ 6 \end{array}$$



- ⑤ Given points M(3, 4) and N(-2, -6), find the coordinates of the point on directed line segment MN that partitions MN in the ratio 4:1. Show work. Graph the point.

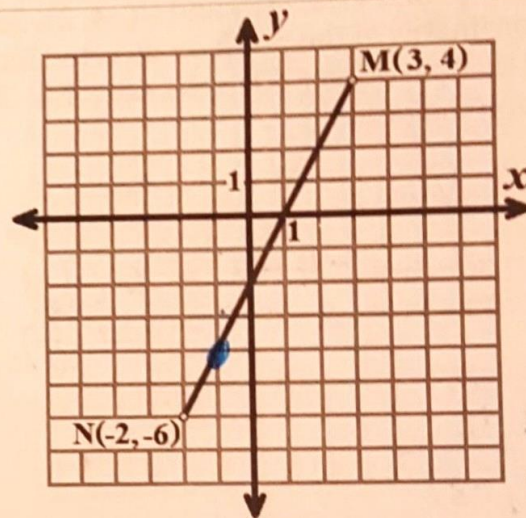
$$4:1 = \frac{4}{5}$$

$$\Delta x = x_2 - x_1 = -2 - 3 = -5 \left(\frac{4}{5}\right) = -4$$

$$\Delta y = y_2 - y_1 = -6 - 4 = -10 \left(\frac{4}{5}\right) = -8$$

$$M(3, 4)$$

$$\begin{array}{r} -4 \ -8 \\ \hline -11 \ -4 \end{array}$$



- ⑥ Given points K(8, -5) and J(-6, 2), find the coordinates of the point on directed line segment KJ that partitions KJ in the ratio 4:3. Show work. Graph the point.

$$4:3 = \frac{4}{7}$$

$$\Delta x = x_2 - x_1 = -6 - 8 = -14 \left(\frac{4}{7}\right) = -8$$

$$\Delta y = y_2 - y_1 = 2 - (-5) = 7 \left(\frac{4}{7}\right) = 4$$

$$K(8, -5)$$

$$\begin{array}{r} -8 \ 4 \\ \hline 0, \ 1 \end{array}$$

