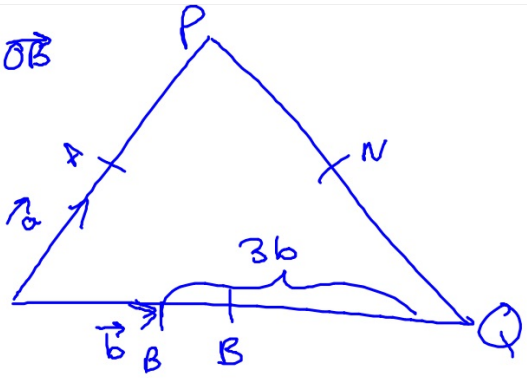
12H 1-c $\quad \vec{a} = \overrightarrow{OA}$ $\vec{b} = \overrightarrow{OB}$

1. $\overrightarrow{PQ} = 4\vec{b} - 2\vec{a}$

$\overrightarrow{PQ} = -\overrightarrow{AP} - \overrightarrow{OA} + \overrightarrow{OB} + \overrightarrow{BQ}$

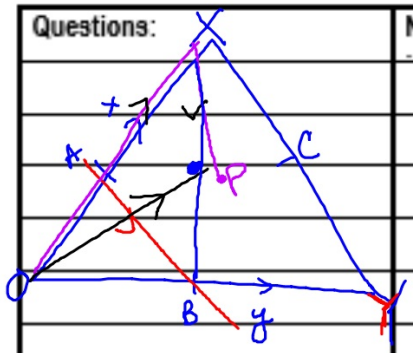
$= -\vec{a} - \vec{a} + \vec{b} + 3\vec{b}$

$= 4\vec{b} - 2\vec{a}$



$BQ = 3\overrightarrow{OB}$

Questions:



$\overrightarrow{OA} = \frac{1}{2}x$

$\overrightarrow{OB} = \frac{1}{2}y$

$\overrightarrow{XY} = y - x$

$\overrightarrow{OC} = \frac{1}{2}(x+y)$

$\overrightarrow{CO} - \overrightarrow{OC} = -\frac{1}{2}(x+y)$

HW p. 425
2, 3, 5

Notes:

b. Find an expression for $\overrightarrow{AB}$ in terms of x

What is the relationship between the line XY and the line AB?

$\overrightarrow{AB} = \overrightarrow{AO} + \overrightarrow{OB} = -\frac{1}{2}x + \frac{1}{2}y$

$= \frac{1}{2}(y - x)$

Since $\overrightarrow{XY} = y - x$ and $\overrightarrow{AB} = \frac{1}{2}(y-x)$ then AB is $\frac{1}{2}$ XY and in the same direction as XY $\therefore \overleftrightarrow{AB} \parallel \overleftrightarrow{XY}$

c. P is the point such that $\overrightarrow{OP} = \overrightarrow{OX} + \frac{2}{3}\overrightarrow{XB}$.

Find $\overrightarrow{OP}$. $\overrightarrow{OP} = \overrightarrow{OX} + \frac{2}{3}\overrightarrow{XP}$

$= x + \frac{2}{3}(\overrightarrow{XO} + \overrightarrow{OB})$

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

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

$= \frac{1}{3}(x+y)$

d. What can you conclude about point P?

it is 2/3 of the way along line OC.