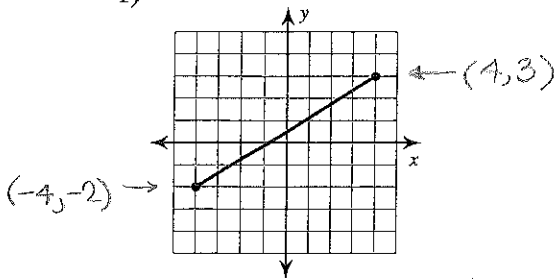


The Distance Formula

Find the distance between each pair of points.

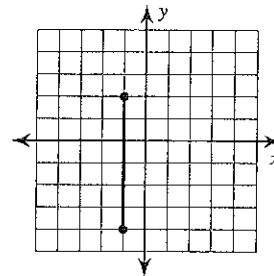
1)



$$d = \sqrt{(-4 - 4)^2 + (-2 - 3)^2}$$

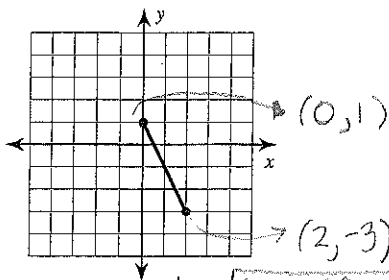
$$d = \sqrt{64 + 25} = \sqrt{89}$$

2)



6 units

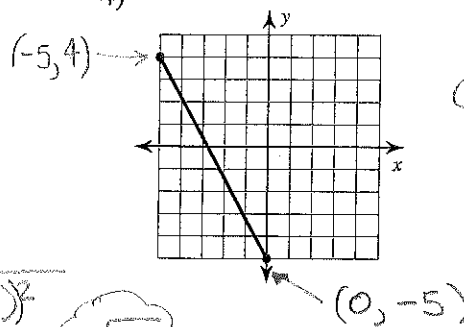
3)



$$d = \sqrt{(0 - 2)^2 + (1 - (-3))^2}$$

$$d = \sqrt{4 + 16} = \sqrt{20} = 2\sqrt{5}$$

4)



$$d = \sqrt{(0 - (-5))^2 + (4 - (-5))^2}$$

$$d = \sqrt{25 + 81}$$

$$d = \sqrt{106}$$

5) (-1, 2), (2, -4)

6) (4, 3), (-3, 4)

7) (0, 4), (2, 3)

8) (4, 0), (-4, 1)

9) (12, 12), (-3, 1)

$$\left(\frac{12 + (-3)}{2}, \frac{12 + 1}{2} \right)$$

$$\left(\frac{9}{2}, \frac{13}{2} \right)$$

10) (1, -9), (6, -6)

Midpoint

11) (5, 5), (-6, -4)

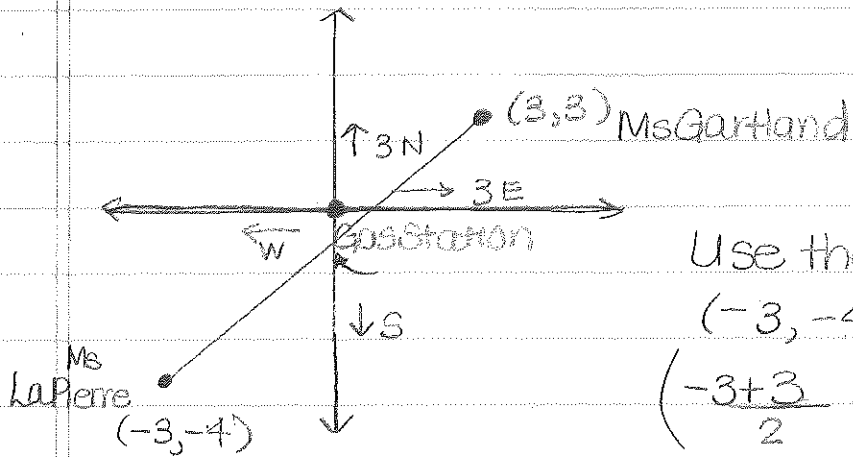
$$\left(\frac{5 + (-6)}{2}, \frac{5 + (-4)}{2} \right)$$

$$\left(-\frac{1}{2}, \frac{1}{2} \right)$$

Find the midpoints

Homework

①



Use the midpt formula

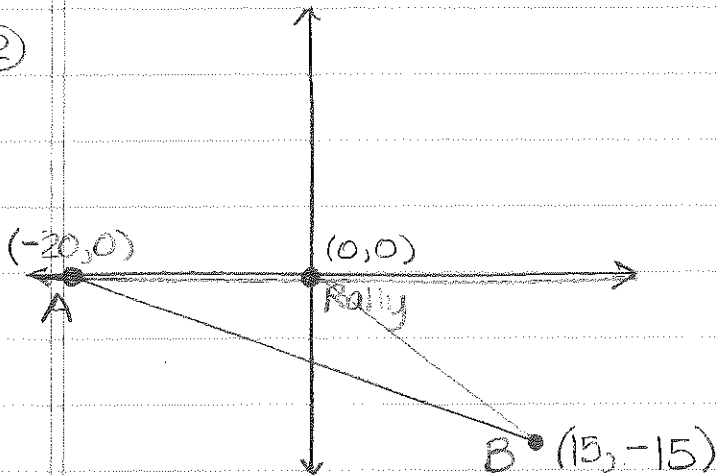
$$(-3, -4) \quad (3, 3)$$

$$\left(\frac{-3+3}{2}, \frac{-4+3}{2} \right)$$

$$\left(0, \frac{1}{2} \right)$$

$\frac{1}{2}$ mi south of
the gas station

②



$$a. d = \sqrt{(-20-15)^2 + (0-15)^2}$$

$$d = \sqrt{1225 + 225}$$

$$d = \sqrt{1450} = 5\sqrt{58}$$

b. Helicopter A is 20 mi away

Helicopter B is

$$d = \sqrt{15^2 + 15^2} = \sqrt{450} = 15\sqrt{2}$$

$$c. d = rt$$

$$A \Rightarrow \frac{20}{80} = \frac{80t}{80}$$

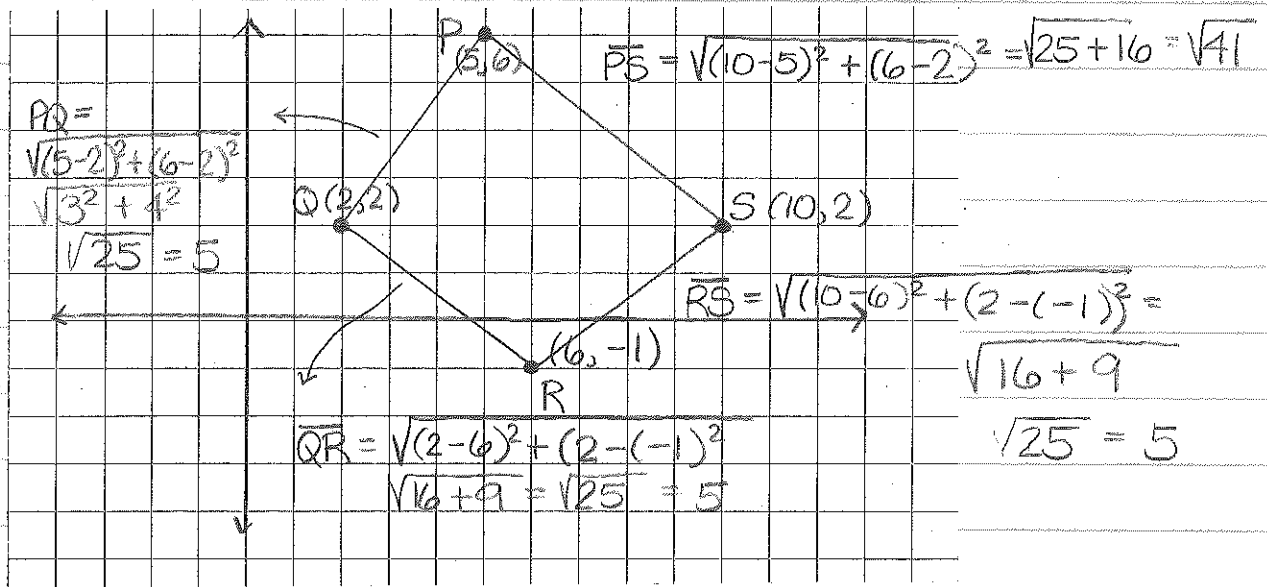
$$t = .25 \text{ hrs}$$

$$B \Rightarrow \frac{15\sqrt{2}}{80} = \frac{80t}{80}$$

$$.265 = t$$

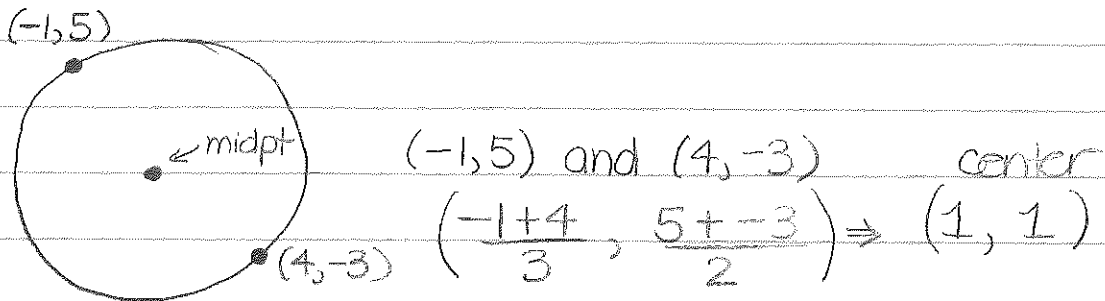
$$\approx .3 \text{ hrs}$$

③



No, 3 out of 4 sides are 5 units, but the 4th side is $\sqrt{41}$ units

④



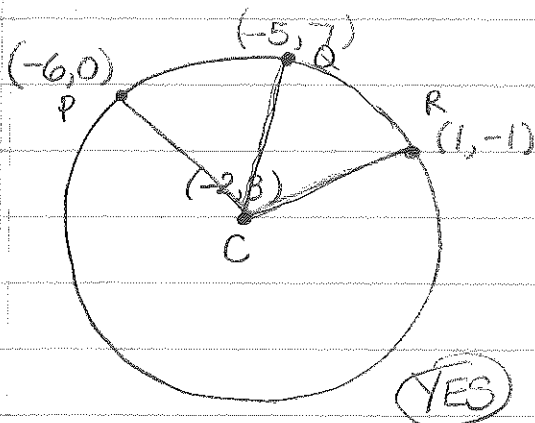
⑤

(-1, y) and (7, 16) midpt is (3, 4)

$$\frac{-1+7}{2} = 3 \quad \frac{y+16}{2} = 4 \quad \text{so } y+16=8$$

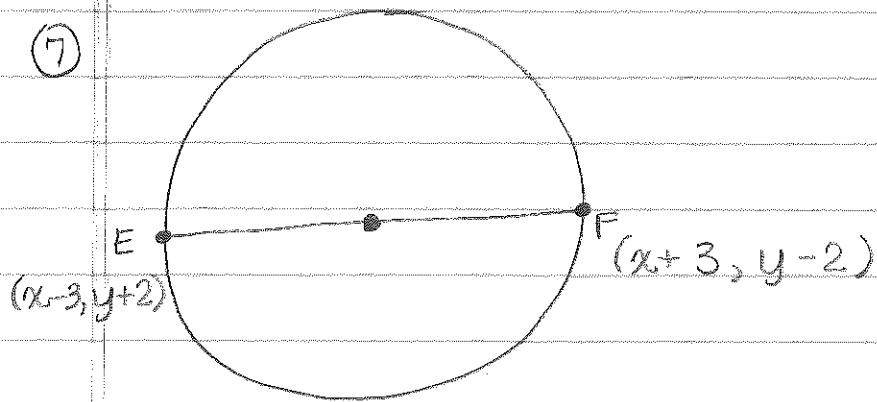
$y = -8$

⑥



$d = \sqrt{(-6-(-2))^2 + (0-3)^2} = \sqrt{25} = 5$
 $d = \sqrt{(-5-(-2))^2 + (7-3)^2} = \sqrt{25} = 5$
 $d = \sqrt{(-2-1)^2 + (3-(-1))^2} = \sqrt{25} = 5$

⑦



$$\frac{x-3+(x+3)}{2}, \quad \frac{y+2+y-2}{2}$$

$$\left(\frac{2x}{2}, \frac{2y}{2} \right)$$

$$(x, y)$$