

1) $A(6, -5), B(-2, 1), C(0, 3)$

Distance between 2 coordinates $= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$$\begin{aligned} AB &= \sqrt{(-2 - 6)^2 + (1 - (-5))^2} \\ &= \sqrt{(-8)^2 + (6)^2} \\ &= \sqrt{64 + 36} \\ &= \sqrt{100} \\ &= 10 \end{aligned}$$

$$\begin{aligned} AC &= \sqrt{(0 - 6)^2 + (3 - (-5))^2} \\ &= \sqrt{(-6)^2 + (8)^2} \\ &= \sqrt{36 + 64} \\ &= \sqrt{100} \\ &= 10 \end{aligned}$$

$$\begin{aligned} BC &= \sqrt{(0 - (-2))^2 + (3 - 1)^2} \\ &= \sqrt{(2)^2 + (2)^2} \\ &= \sqrt{4 + 4} \\ &= \sqrt{8} \end{aligned}$$

2) a) $\frac{m_1 x_2 + m_2 x_1}{m_1 + m_2}$

$$5 = \frac{m_1 \times 4 + m_2 \times -4}{m_1 + m_2}$$

~~14 +~~

$$5m_1 + 5m_2 = 4m_1 - 4m_2$$

$$5m_2 + 4m_2 = 4m_1 - 5m_1$$

$$9m_2 = 9m_1$$

$$\frac{m_2}{m_1} = \frac{9}{9}$$

$$b) \quad x = \frac{m x_2 - n x_1}{m - n}$$

$$~~14 = \frac{m \times 3 - n \times 5}{m - n}~~$$

$$14 = \frac{m \times -4 - n \times 5}{m - n}$$

$$14(m - n) = -4m - 5n$$

$$14m - 14n = -4m - 5n$$

$$14m + 4m = -5n + 14n$$

$$18m = 9n$$

$$\frac{m}{n} = \frac{18}{9} = \frac{2}{1}$$