

Midpoint Applications Examples

9/19/18

- 1) The coordinates of A are $(4, 5)$ and the coordinates of B are $(10, y)$. If the midpoint of AB is $(7, 2)$, find the value of y .

$$\frac{y_1 + y_2}{2} = 2 ; \frac{5 + y}{2} = 2$$

$$\frac{5 + y}{2} = 2$$

$$5 + y = 4$$

$$-5 \quad -5$$

$$y = -1$$

$$M\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

$$M(7, 2)$$

$$B(10, -1)$$

- 2) The midpoint of AB is M. If the coordinates of A are $(2, -6)$ and the coordinates of M are $(5, 1)$, what are the coordinates of B?

$$\textcircled{1} \frac{x_1 + x_2}{2} = 5 ; \frac{2 + x_2}{2} = 5$$

$$\frac{2 + x_2}{2} = 5$$

$$2 + x_2 = 10$$

$$-2 \quad -2$$

$$x_2 = 8$$

$$B(8, 8)$$

$$\textcircled{2} \frac{y_1 + y_2}{2} = 1 ; \frac{-6 + y_2}{2} = 1$$

$$\frac{-6 + y_2}{2} = 1$$

$$-6 + y_2 = 2$$

$$+6 \quad +6$$

$$y_2 = 8$$

- 3) The coordinates of the midpoint of AB are $(1, 2)$. If the coordinates of point A are $(1, 0)$, find the coordinates of point B.

$$\textcircled{1} \frac{x_1 + x_2}{2} = 1 ; \frac{1 + x_2}{2} = 1$$

$$\frac{1 + x_2}{2} = 1$$

$$1 + x_2 = 2$$

$$-1 \quad -1$$

$$x_2 = 1$$

$$\textcircled{2} \frac{y_1 + y_2}{2} = 2 ; \frac{0 + y_2}{2} = 2$$

$$\frac{0 + y_2}{2} = 2$$

$$0 + y_2 = 4$$

$$y_2 = 4$$

$$B(1, 4)$$