Midpoint and Distance in the Coordinate Plane Exit Quiz

Multiple choices
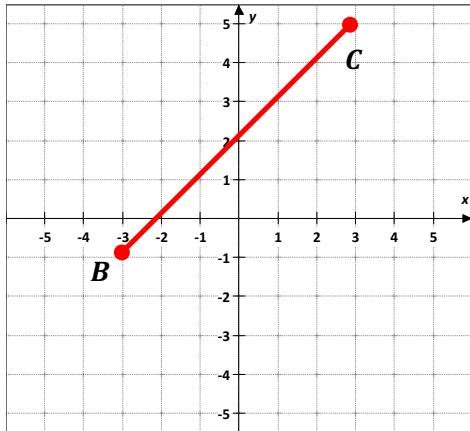
1. The endpoints of $\overline{AB}$ are $A(4,2)$ and $B(1,-2)$. What are the coordinates of the midpoint of $\overline{AB}$?

   a. $(2.5, 0)$ **b.** $(2.5, 0.5)$

   c. $(1.5, 0)$ **d.** $(0, 2.5)$

2. What is the distance between $(6,1)$ and $(1,-9)$

   a. $\sqrt{5}$ **b.** $\sqrt{89}$

   c. $5\sqrt{5}$ **d.** $2\sqrt{5}$

3. What is the midpoint of segment $\overline{BC}$ shown in the graph?

   a. $(1,2)$ **b.** $(0,2)$

   c. $(2,2)$ **d.** $(2,0)$

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4. Determine the point B on the y-axis that is equidistant from $F(3, 1)$ and $H(4, -1)$

5. **Determine if $D(1, 5)$, $B(8, 1)$ and $H(1, 1)$ are the vertices of a right triangle.**

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<mark>ANSWERS</mark>

Multiple choices

1. The endpoints of $\overline{AB}$ are $A(4, 2)$ and $B(1, -2)$. What are the coordinates of the midpoint of $\overline{AB}$?

   <mark>**a.** $(2.5, 0)$</mark>   **b.** $(2.5, 0.5)$

   c. $(1.5, 0)$ **d.** $(0, 2.5)$

2. What is the distance between $(6, 1)$ and $(1, -9)$

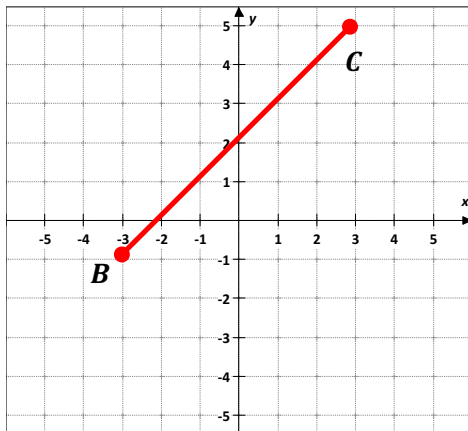   **a.** $\sqrt{5}$ **b.** $\sqrt{89}$

   <mark>**c.** $5\sqrt{5}$</mark>   **d.** $2\sqrt{5}$

3. What is the midpoint of segment $\overline{BC}$ shown in the graph?

   a. $(1, 2)$ <mark>**b.** $(0, 2)$</mark>

   c. $(2, 2)$ **d.** $(2, 0)$

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4. Determine the point B on the y-axis that is equidistant from $F(3, 1)$ and $H(4, -1)$

$$B(0, y)$$
$$F(3, 1), B(0, y) \ and \ H(4, -1)$$
$$d(F, B) = d(B, H)$$
$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$
$$\sqrt{(0 - 3)^2 + (y - 1)^2} = \sqrt{(0 - 4)^2 + (y - (-1))^2}$$
$$(0 - 3)^2 + (y - 1)^2 = (0 - 4)^2 + \left(y - (-1)\right)^2$$
$$(3)^2 + (y - 1)^2 = (-4)^2 + (y + 1)^2$$
$$9 + y^2 - 2y + 1 = 16 + y^2 + 2y + 1$$
$$9 + y^2 - 2y + 1 - y^2 = 16 + y^2 + 2y + 1 - y^2$$
$$-2y + 10 = 2y + 17$$
$$-2y + 10 - 2y = 2y + 17 - 2y$$
$$-4y + 10 = 17$$
$$-4y + 10 - 10 = 17 - 10$$
$$-4y = 7$$

$$y = -\frac{7}{4}$$

$$\boxed{B\left(0, -\frac{7}{4}\right)}$$

5. **Determine if $D(1, 5)$, $B(8, 1)$ and $H(1, 1)$ are the vertices of a right triangle.**

$$d(D, B) = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$
$$d(D, B) = \sqrt{(8 - 1)^2 + (1 - 5)^2}$$
$$d(D, B) = \sqrt{(7)^2 + (-4)^2}$$
$$d(D, B) = \sqrt{49 + 16}$$
$$d(D, B) = \sqrt{65}$$
$$d(B, H) = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$
$$d(B, H) = \sqrt{(1 - 8)^2 + (1 - 1)^2}$$
$$d(B, H) = \sqrt{(-7)^2 + (0)^2}$$
$$d(B, H) = \sqrt{49 + 0}$$
$$d(B, H) = \sqrt{49}$$
$$d(B, H) = 7$$
$$d(D, H) = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$
$$d(D, H) = \sqrt{(1 - 1)^2 + (1 - 5)^2}$$
$$d(D, H) = \sqrt{(0)^2 + (-4)^2}$$
$$d(D, H) = \sqrt{0 + 16}$$
$$d(D, H) = \sqrt{16}$$
$$d(D, H) = 4$$

$$(\overline{DB})^2 = (\overline{BH})^2 + (\overline{DH})^2$$
$$\left(\sqrt{65}\right)^2 = (7)^2 + (4)^2$$
$$65 = 49 + 16$$
$$65 = 65$$