

DO NOW

Square $ABCD$ has vertices $A(-2, -3)$, $B(4, -1)$, $C(2, 5)$, and $D(-4, 3)$. What is the length of a side of the square?

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

$$d = \sqrt{(4 - (-2))^2 + (-1 - (-3))^2}$$

$$d = \sqrt{40}$$

$$\begin{array}{c} \sqrt{40} \\ / \quad \backslash \\ \sqrt{4} \cdot \sqrt{10} \\ \boxed{2\sqrt{10}} \end{array}$$

AB ✓

CD ✓

BC ✓

AD ✓

Dec 6-9:59 AM

To find the midpoint of a line segment \overline{AB} with $A(x_1, y_1)$ and $B(x_2, y_2)$ use the formula:

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

If two line segments have the same midpoint,
then they bisect each other

Dec 6-10:41 AM

- 1) Find the midpoint of \overline{AB} with $A(-2, 2)$ and $B(6, -4)$

$$\text{Midpoint} = \left(\frac{-2+6}{2}, \frac{2+(-4)}{2} \right)$$

$$\text{Midpoint} = (2, -1)$$

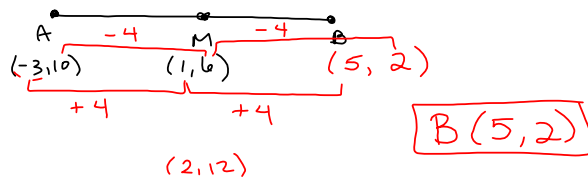
- 2) Find the midpoint of \overline{PQ} with $P(4, -2)$ and $Q(-2, -7)$

$$\text{Midpoint} = \left(\frac{4+(-2)}{2}, \frac{-2+(-7)}{2} \right)$$

$$\text{Midpoint} = \left(1, -\frac{9}{2} \right)$$

Dec 6-10:44 AM

- 3) Given M is the midpoint of \overline{AB} . The coordinates of A are $(-3, 10)$ and the coordinates of M are $(1, 6)$. Find the coordinates of B .



- 4) Write the equation of the perpendicular bisector of the line segment whose endpoints are $E(-3, 2)$ and $F(9, 10)$

★ \perp to \overline{EF}
through midpoint
of \overline{EF} ★

\perp slope = $-\frac{3}{2}$
through $(3, 6)$

Find slope of \overline{EF}

$$m = \frac{10-2}{9-(-3)} = \frac{8}{12} = \frac{2}{3}$$

Find midpoint of \overline{EF}

$$\text{Midpoint} = \left(\frac{-3+9}{2}, \frac{2+10}{2} \right)$$

$$\text{M.P.} = (3, 6)$$

$$y - y_1 = m(x - x_1)$$

$$y - 6 = -\frac{3}{2}(x - 3)$$

Apr 4-9:41 AM

- 5) Given D (-8,-8), E (-3,4), F (1,-2), G (6,10)
Prove \overline{DG} and \overline{EF} bisect each other

$$\begin{aligned}\text{Midpoint of } \overline{DG} &= \left(\frac{-8+6}{2}, \frac{-8+10}{2} \right) \\ &= (-1, 1)\end{aligned}$$

$$\begin{aligned}\text{Midpoint of } \overline{EF} &= \left(\frac{-3+1}{2}, \frac{4+(-2)}{2} \right) \\ &= (-1, 1)\end{aligned}$$

Since \overline{DG} + \overline{EF} have the same midpoint
they must bisect each other

Dec 6-10:55 AM