Mathematics 10D

2.1 – Midpoint of a Line Segment

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Five Things Needed to Succeed

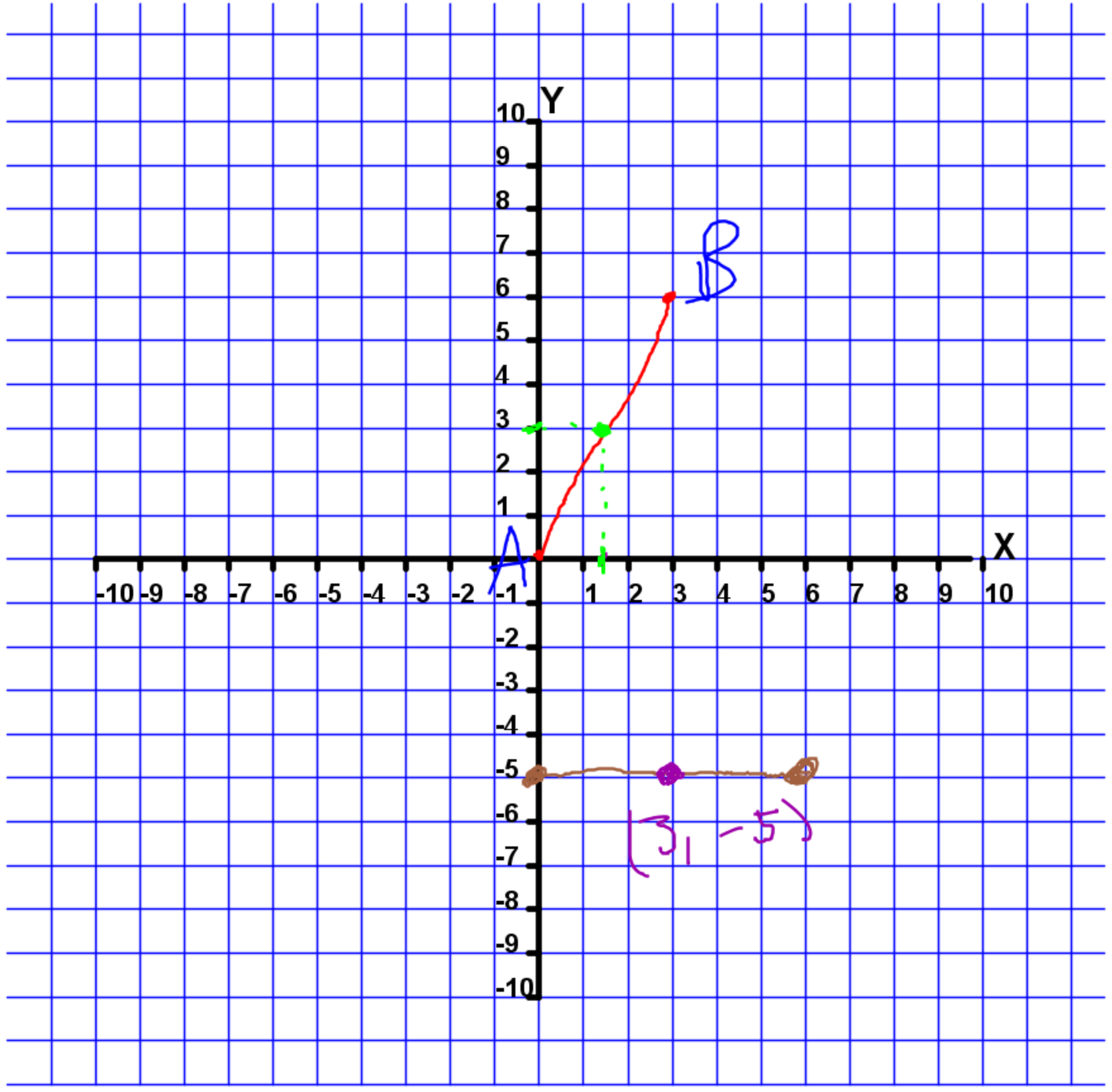
1) Slope formula → $m = \frac{y_2 - y_1}{x_2 - x_1}$
2) Create linear equations (y=mx+b) ⇒ Given two points or a slope and point.
3) Finding POI
4) Midpoint formula
5) Distance Formula

Midpoint:

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

$A(0,0)$ $B(3,6)$

$$M_{AB}\left(\frac{3}{2}, 3\right)$$



1) $A(-8, 7), B(-2, -2)$

$$M_{AB}\left(\frac{-8+-2}{2}, \frac{7+-2}{2}\right)$$

$$M_{AB}\left(-5, \frac{5}{2}\right)$$

2) C(4, 0), D(−4, 8)

$$x_m = \frac{x_1 + x_2}{2} \qquad y_m = \frac{y_1 + y_2}{2}$$

$$x_m = \frac{4 + -4}{2} = 0 \qquad y_m = \frac{0 + 8}{2} = 4$$

$$M_{CD}(0, 4)$$

3) $E(88, -843), F(968, -449)$

$$M_{EF}\left(\frac{88+968}{2}, \frac{-843+-449}{2}\right)$$

$$M_{EF}\left(528, -646\right)$$

4) Endpoint: $A(-5, 4)$, midpoint: $(-9, -5)$ $B(?, ?)$

M_{AB}

$$x_m = \frac{x_A + x_B}{2}$$

$$-9 = \frac{-5 + x_B}{2}$$

$$-18 = -5 + x_B$$

$$-13 = x_B$$

$$y_m = \frac{y_A + y_B}{2}$$

$$-5 = \frac{4 + y_B}{2}$$

$$-10 = 4 + y_B$$

$$-14 = y_B$$

$B(-13, -14)$