Unit 6: Geometric and Algebraic Conn. Distance, Midpoint, and Slope Notes

Name: _____ Date: _____ Period: _____

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

EX1: (-7, -6), (1, 3) $x_1\ y_1\ x_2\ y_2$

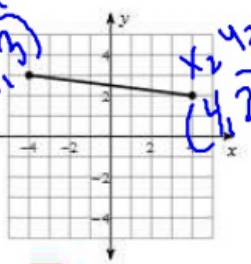
$\sqrt{(1+7)^2+(3+6)^2} = 12.84$

$\sqrt{8^2+9^2}$

$\sqrt{64+81}$

$\sqrt{145}$

EX2:



$(-4, 3)$ $(4, 2)$

$\sqrt{(4--4)^2+(2-3)^2} = 8.06$

MIDPPOINT FORMULA $(x, y) = \left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

EX1: (-2, 10), (7, 9) $x_1\ y_1\ x_2\ y_2$

End

Mid

End

$\left(\frac{-2+7}{2}, \frac{10+9}{2}\right)$

$\left(\frac{5}{2}, \frac{19}{2}\right)$

$(2.5, 9.5)$

EX2: (-6, 10), (10, 2) $x_1\ y_1\ x_2\ y_2$

$\left(\frac{-6+10}{2}, \frac{10+2}{2}\right)$

$\frac{4}{2}, \frac{12}{2}$

$(2, 6)$

BACKWARDS Given the midpoint and one endpoint o a lien segment, find the other endpoint.

End?

Mid

End

EX3: Endpoint: (-8, -9), midpoint: (-5, 0) $x_1\ y_1$ ANS

$\frac{-8+x_2}{2} = -5 \cdot 2$

$-8+x_2 = -10$

$+8 \quad +8$

$x_2 = -2$

$\frac{-9+y_2}{2} = 0 \cdot 2$

$-9+y_2 = 0$

$+9 \quad +9$

$y_2 = 9$

$(-2, 9)$

EX4: Endpoint: (-3, -6), midpoint (-2, 7) $x_1\ y_1$ ANS

$\frac{-3+x_2}{2} = -2 \cdot 2$

$-3+x_2 = -4$

$+3 \quad +3$

$x_2 = -1$

$\frac{-6+y_2}{2} = 7 \cdot 2$

$-6+y_2 = 14$

$+6 \quad +6$

$y_2 = 20$

$(-1, 20)$

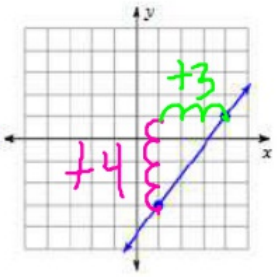
SLOPE FORMULA: $M = \frac{y_2 - y_1}{x_2 - x_1}$ Rise / Run +

x_1, y_1 x_2, y_2

EX1: (-1, 7), (14, 17)

$\frac{17-7}{14+1} = \frac{10 \div 5}{15 \div 5} = \boxed{\frac{2}{3}}$

EX2:



— + $\boxed{\frac{4}{3}}$

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