Midpoints / Distance

- midpoint → point in middle of line segment
  - ↳ average of endpoints

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

EX → 5 + 11

$\frac{16}{2} = 8$

EX → -2 + 6

$\frac{4}{2} = 2$

EX → (10, -5), (-11, -8)

$\frac{10-11}{2}, \frac{-5-8}{2}$

$\frac{-1}{2}, \frac{-13}{2}$

EX → (3, 5), (1, 9)

$\frac{3+1}{2}, \frac{5+9}{2}$

2, 7

EX → (-2, 2), (-5, -4)

$\frac{-2-5}{2}, \frac{2-4}{2}$

$\frac{-7}{2}, -1$

- Midpoint & 1 Endpoint

$\underline{EX} \to \overline{RT}$, $R(3,7)$, $M(1,2)$

$T(1-2, 2-5)$

$T(-1,-3)$

$\underline{EX} \to \overline{RT}$, $R(2,3)$, $M(-2,1)$

$T(-2-4, 1-2)$

$T(-6,-1)$

$\underline{EX} \to \overline{RT}$, $R(1,3)$

$M(-5,4)$

$T(-5-6, 4+1)$

$T(-11,5)$

$\underline{EX} \to \overline{RT}$, $R(1,5)$, $M(7,11)$

$T(7+6, 11+6)$

$T(13,17)$

$\underline{EX} \to \overline{RT}$, $R(2,-3)$, $M(-8,7)$

$T(-8-10, 7+10)$

$T(-18,17)$

$\underline{EX} \to \overline{RT}$, $R(1,1)$

$M(-5,4)$

$T(-5-6, 4+3)$

$T(-11,7)$

HW: p. 54 → 6-21

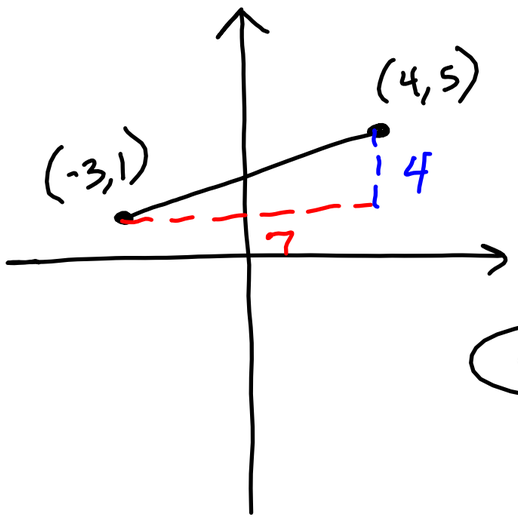
- Distance

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

Pythagorean Thm

$a^2 + b^2 = c^2$

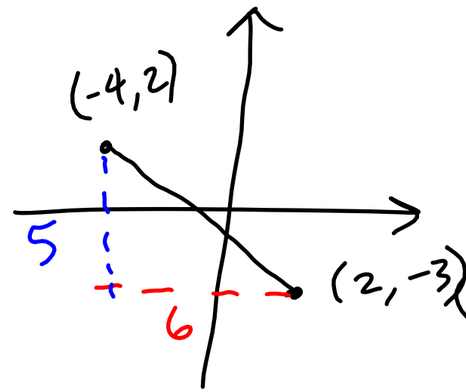
$c = \sqrt{a^2 + b^2}$



$d = \sqrt{7^2 + 4^2}$

$= \sqrt{49 + 16}$

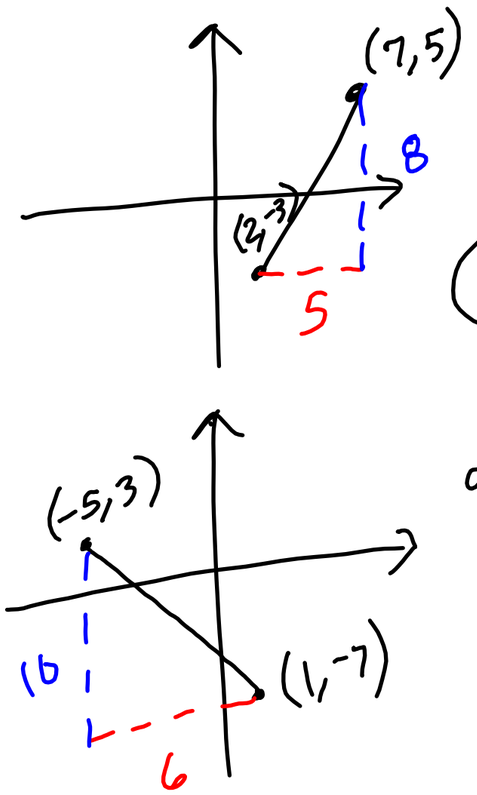
$d = \sqrt{65}$



$d = \sqrt{5^2 + 6^2}$

$= \sqrt{25 + 36}$

$d = \sqrt{61}$



$d = \sqrt{5^2 + 8^2}$

$= \sqrt{25 + 64}$

$d = \sqrt{89}$

$d = \sqrt{6^2 + 10^2}$

$= \sqrt{36 + 100}$

$= \sqrt{136}$ $= \sqrt{4} \cdot \sqrt{34}$

$d = 2\sqrt{34}$

EX → $(5,7), (3,1)$

6 (vertical), 2 (horizontal)

$d = \sqrt{2^2 + 6^2}$

$= \sqrt{4 + 36} = \sqrt{40}$

$= \sqrt{4} \cdot \sqrt{10} = \boxed{2\sqrt{10}}$

EX → $(3,-2), (2,4)$

6 (vertical), 1 (horizontal)

$d = \sqrt{1^2 + 6^2}$

$= \sqrt{1 + 36} = \boxed{\sqrt{37}}$

EX → $(9,6), (10,3)$

3 (vertical), 1 (horizontal)

$d = \sqrt{1^2 + 3^2}$

$= \sqrt{1 + 9} = \boxed{\sqrt{10}}$

HW: p. 54 → 22-35, 36-44 even, 64