Name: _____ **Date** _____ **#46 Distance**

Directions: Use the <u>distance formula</u> to find the distance between the two points. Give your answer as a simplified radical.

See next page for work

1) (1, 3), (5, 7)

$d = 4\sqrt{2}$ units ≈ 5.66

2) (−8, −9), (−4, −10)

$d = \sqrt{17}$ units ≈ 4.12

3) (10, 6), (1, −4)

$d = \sqrt{181}$ units ≈ 13.45

4) (3, 2), (8, 2)

$d = 5$ units

5) (9, −3), (−1, 8)

$d = \sqrt{221}$ units ≈ 14.87

6) (10, 0), (0, 4)

$d = 2\sqrt{29}$ units ≈ 10.77

7) (−7, −2), (6, 9)

$d = \sqrt{290}$ units ≈ 17.03

8) (−6, 5), (8, −3)

$d = 2\sqrt{65}$ units ≈ 16.12

Review skill: Pick two and find the equation of the line through the pair of points. (You may write your answer in any form you want.) ← smart choice is point slope!

Choice 1: _____   **Choice 2:** _____

see last page for all possible answers

① $d = \sqrt{(1-5)^2 + (3-7)^2}$
$d = \sqrt{(-4)^2 + (-4)^2}$
$d = \sqrt{16 + 16}$
$d = \sqrt{32}$
$d = \sqrt{16 \cdot 2}$
$d = 4\sqrt{2}$ units
$d \approx 5.66$

② $d = \sqrt{(-8 - -4)^2 + (-9 - -10)^2}$
$d = \sqrt{(-4)^2 + (1)^2}$
$d = \sqrt{16 + 1}$
$d = \sqrt{17}$ units
$d \approx 4.12$

③ $d = \sqrt{(10-1)^2 + (6 - -4)^2}$
$d = \sqrt{(9)^2 + (10)^2}$
$d = \sqrt{81 + 100}$
$d = \sqrt{181}$ units
$d \approx 13.45$

④ $d = \sqrt{(3-8)^2 + (2-2)^2}$
$d = \sqrt{(-5)^2 + (0)^2}$
$d = \sqrt{25 + 0}$
$d = \sqrt{25}$
$d = 5$ units

⑤ $d = \sqrt{(9 - -1)^2 + (-3 - 8)^2}$
$d = \sqrt{(10)^2 + (-11)^2}$
$d = \sqrt{100 + 121}$
$d = \sqrt{221}$ units
$d \approx 14.87$

⑥ $d = \sqrt{(10 - 0)^2 + (0 - 4)^2}$
$d = \sqrt{(10)^2 + (-4)^2}$
$d = \sqrt{100 + 16}$
$d = \sqrt{116}$
$d = \sqrt{4 \cdot 29}$
$d = 2\sqrt{29}$ units
$d \approx 10.77$

⑦ $d = \sqrt{(-7 - 6)^2 + (-2 - 9)^2}$
$d = \sqrt{(-13)^2 + (-11)^2}$
$d = \sqrt{169 + 121}$
$d = \sqrt{290}$ units
$d \approx 17.03$

⑧ $d = \sqrt{(-6 - 8)^2 + (5 - -3)^2}$
$d = \sqrt{(-14)^2 + (8)^2}$
$d = \sqrt{196 + 64}$
$d = \sqrt{260}$
$d = \sqrt{4 \cdot 65}$
$d = 2\sqrt{65}$ units
$d \approx 16.12$

$$d = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$$
$$\underset{\Delta x}{\uparrow} \qquad \underset{\Delta y}{\uparrow}$$

Eq. of Line: Remember in the distance formula you found Δy & Δx

$$m = \frac{\Delta y}{\Delta x}$$

pt-slope   **Slope intercept**

m
$\frac{-4}{-4} = -1$

① $y - 3 = 1(x-1)$ $\frac{y-3 = 1x - 1}{+3 \qquad +3}$ OR $y = x + 2$

OR $y = 1x + 2$

$y - 7 = 1(x-5)$

m
$-\frac{1}{4}$

② $y + 9 = -\frac{1}{4}(x+8)$ $\frac{y + 9 = -\frac{1}{4}x - 2}{-9 \qquad -9}$ OR $y = -\frac{1}{4}x - 11$

OR $y = -\frac{1}{4}x - 11$

$y + 10 = -\frac{1}{4}(x+4)$

m
$\frac{10}{9}$

③ $y - 6 = \frac{10}{9}(x-10)$ $y + 4 = \frac{10}{9}x - \frac{10}{9}$ OR $y = \frac{10}{9}x - \frac{46}{9}$

              $-4 \qquad -\frac{36}{9}$

OR

$y + 4 = \frac{10}{9}(x-1)$

m
$\frac{0}{5} = 0$

④ $y = 2$

m
$-\frac{11}{10}$

⑤ $y + 3 = -\frac{11}{10}(x-9)$ $y - 8 = -\frac{11}{10}x - \frac{11}{10}$ OR $y = -\frac{11}{10}x + \frac{69}{10}$

OR $+8 \qquad +\frac{80}{10}$

$y - 8 = -\frac{11}{10}(x+1)$

m
$-\frac{4}{10} = -\frac{2}{5}$

⑥ $y - 4 = -\frac{2}{5}(x-0)$

    $y - 4 = -\frac{2}{5}x$ OR $y = -\frac{2}{5}x + 4$

OR

$y - 0 = -\frac{2}{5}(x-10)$

      $y = -2/5(x-10)$

m
$\frac{-11}{-13} = \frac{11}{13}$

⑦ $y + 2 = \frac{11}{13}(x+7)$ $y + 2 = \frac{11}{13}x + \frac{77}{13}$ OR $y = \frac{11}{13}x + \frac{51}{13}$

OR $-2 \qquad -\frac{26}{13}$

$y - 9 = \frac{11}{13}(x-6)$

m
$\frac{8}{-14} = -\frac{4}{7}$

⑧ $y - 5 = -\frac{4}{7}(x+6)$ $y + 3 = -\frac{4}{7}x + \frac{32}{7}$ OR $y = -\frac{4}{7}x + \frac{11}{7}$

OR $-3 \qquad -\frac{21}{7}$

$y + 3 = -\frac{4}{7}(x-8)$