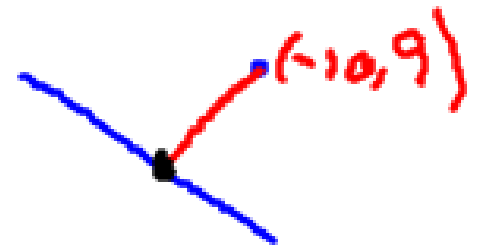


$$1d) (-10, 9)$$

$$y = -4x + 3$$

$$\text{slope} = -4$$

$$\perp \text{slope} = \frac{1}{4}$$



Equation:

$$y = mx + c$$

$$y = \frac{1}{4}x + c$$

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

$$9 = -\frac{10}{4} + c$$

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

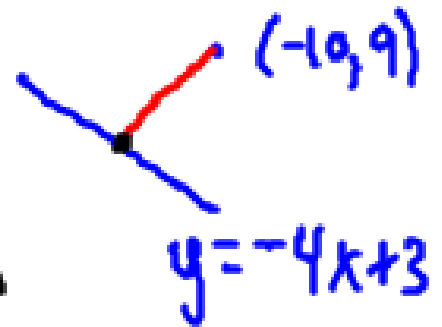
$$9 + \frac{5}{2} = c$$

$$\frac{18}{2} + \frac{5}{2} = c$$

$$\frac{23}{2} = c$$

$$y = \frac{1}{4}x + \frac{23}{2}$$

$$y = -4x + 3 \quad \rightarrow \quad y = \frac{1}{4}x + \frac{23}{2}$$



P.O.I (system of Eqns \rightarrow substitution or elimination)

$$4 \left(-4x + 3 = \frac{1}{4}x + \frac{23}{2} \right)$$

$$-16x + 12 = x + 46$$

$$12 = 16x + x + 46$$

$$-46 + 12 = 17x$$

$$\frac{-34}{17} = \frac{17x}{17}$$

$$x = -2$$

$$y = -4x + 3$$

$$y = -4(-2) + 3$$

$$y = 8 + 3$$

$$y = 11$$

$$(-2, 11)$$

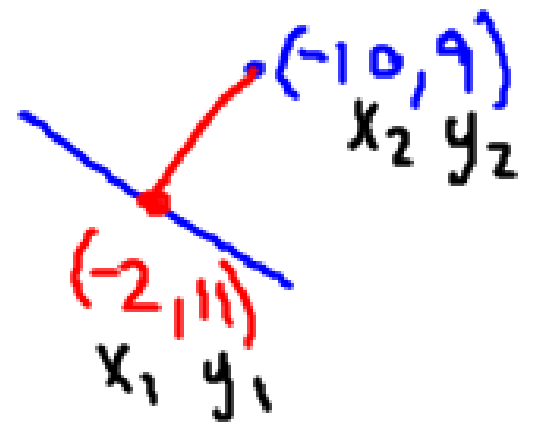
$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(-10 - -2)^2 + (9 - 11)^2}$$

$$d = \sqrt{64 + 4}$$

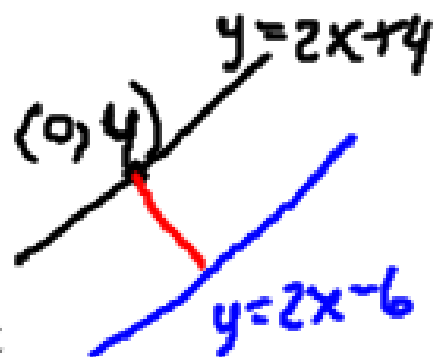
$$d = \sqrt{68}$$

$$d = 2\sqrt{17}$$



Example: Find the distance between the parallel lines:

$$y = 2x + 4 \quad \text{and} \quad y = 2x - 6$$



** Find a point on the first line, then find the distance between that point and the second line.

$$y = 2x + 4$$
$$(0, 4)$$

Fill in anything for x and
solve for y

$$\text{slope} = 2$$

$$\perp \text{slope} = -\frac{1}{2}$$

$$\text{Eq'n: } y = -\frac{1}{2}x + c$$

$$4 = -\frac{1}{2}(0) + c$$

$$4 = c$$

$$y = -\frac{1}{2}x + 4$$

P.O.I (system)

$$y = \underline{2x - 6}$$

$$y = -\frac{1}{2}x + 4$$

$$2(2x - 6 = -\frac{1}{2}x + 4)$$

$$4x - 12 = -x + 8$$

$$5x - 12 = 8$$

$$\frac{5x}{5} = \frac{20}{5}$$

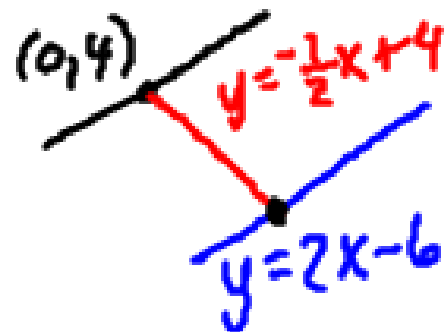
$$x = 4$$

$$y = 2x - 6$$

$$y = 2(4) - 6$$

$$y = 2$$

$$(4, 2)$$



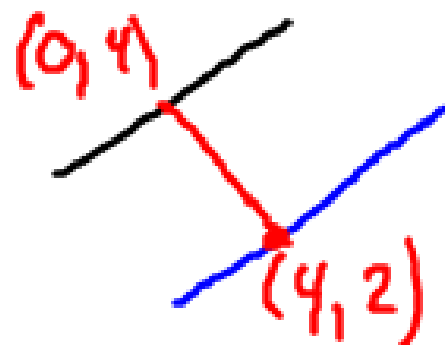
$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(4 - 0)^2 + (2 - 4)^2}$$

$$d = \sqrt{16 + 4}$$

$$d = \sqrt{20}$$

$$d = 2\sqrt{5}$$



$$\left(\frac{a}{b}\right)^2 = \frac{a^2}{b^2}$$

$$\left(\frac{3}{8}\right)^2 = \frac{9}{64}$$

$$\sqrt{\frac{9}{64}} = \frac{\sqrt{9}}{\sqrt{64}} = \frac{3}{8}$$

$$\left(\frac{a}{b}\right)^2 = \frac{a^2}{b^2}$$

$$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$$

HW

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AND

Find the
distance
between
these
lines

- ① $y = 8x - 5$ and $y = 8x + 1$
- ② $4x - y = 7$ and $-4x + y = 20$
- ③ $y = \frac{1}{2}x - \frac{3}{2}$ and $y = \frac{1}{2}x + \frac{5}{2}$