

29)  $m=5$  distance of 3 from  $(0,0)$

$$5x - y \pm 3\sqrt{26} = 0$$

lines w/ slope  $m=5 \Rightarrow 5x + y = 0 \quad y - 0 = 5(x - 0)$

$$d = \frac{|5(0) + 1(0) + 0|}{\sqrt{25+1}}$$

$$3 = \frac{0}{\sqrt{26}}$$

$$y = 5x + 3\sqrt{26}$$

Family of all lines w/ slope  $m=5$  is  $\{y = 5x + b\}$

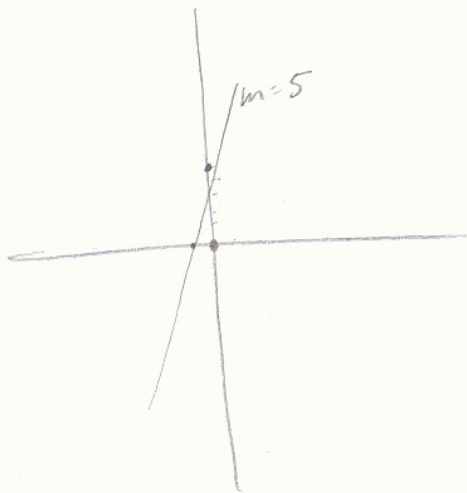
$$y - 0 = 5(x - x_1)$$

$$y - y_1 = 5(x - x_1)$$

$$y - y_1 = 5x - 5x_1$$

$$5x - y = 5x_1 - y_1$$

$$5x - y - (5x_1 - y_1) = 0$$



$$\frac{|5(0) + (-1)(0) - 5x_1 + y_1|}{\sqrt{26}}$$

$$3 = \frac{-5x_1 + y_1}{\sqrt{26}}$$

$$2x - 3y = k$$

$$3y = 2x - k$$

$$y = \frac{2}{3}x - \frac{k}{3}$$

$$y = 5x - k$$

$$5x - y - k = 0$$

$$3 = \frac{|5(0) + (-1)(0) - k|}{\sqrt{26}}$$

$$3 = \frac{|-k|}{\sqrt{26}}$$

$$3\sqrt{26} = k$$

③①  $P = (5, 4)$   $d = 2$  from  $(-1, -3)$

$$15x - 8y - 43 = 0$$

$$3x - 4y + 1 = 0$$

$$y - 4 = m(x - 5)$$

$$y - 4 = mx - 5m$$

$$mx - y - 5m + 4 = 0$$

$$mx - y + (4 - 5m) = 0$$

$$d = \frac{|m(-1) + (-1)(-3) + (4 - 5m)|}{\sqrt{m^2 + 1}}$$

$$2\sqrt{m^2 + 1} = |-m + 3 + 4 - 5m|$$

$$2\sqrt{m^2 + 1} = |-6m + 7|$$

$$4m^2 + 4 = 36m^2 - 84m + 49$$

$$32m^2 - 84m + 45 = 0$$

$$m = \frac{3}{4} \text{ or } m = \frac{15}{8}$$

$$y - 4 = \frac{3}{4}(x - 5)$$

$$(y - 4 = \frac{3}{4}x - \frac{15}{4}) \cdot 4$$

$$4y - 16 = 3x - 15$$

$$3x - 4y + 1 = 0$$

$$y - 4 = \frac{15}{8}(x - 5)$$

$$(y - 4 = \frac{15}{8}x - \frac{75}{8}) \cdot 8$$

$$8y - 32 = 15x - 75$$

$$15x - 8y - 43 = 0$$

$$P = (7, 1) \quad d = 5 \text{ from } (2, -5)$$

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

$$\{y - 1 = m(x - 7) \mid m \text{ real}\} \cup x = 7$$

$$y - 1 = mx - 7m$$

$$mx - y + 1 - 7m = 0$$

$$5 = \frac{|m(2) + (-1)(-5) + 1 - 7m|}{\sqrt{m^2 + 1}}$$

$$5\sqrt{m^2 + 1} = |2m + 5 + 1 - 7m|$$

$$5\sqrt{m^2 + 1} = |-5m + 6|$$

$$5\sqrt{m^2 + 1} = -5m + 6$$

$$25m^2 + 25 = 25m^2 - 60m + 36$$

$$60m = 11$$

$$m = \frac{11}{60}$$

$$y - 1 = \frac{11}{60}(x - 7)$$

$$(y - 1 = \frac{11}{60}x - \frac{77}{60}) 60$$

$$60y - 60 = 11x - 77$$

$$11x - 60y - 17 = 0$$

$$x - 7 = 0$$