Write the equation of the line that is (parallel) to:

y = 3x - 8

and passes through the point (-1, 7) $m=3$

Point-slope

$y - 7 = 3(x+1)$

Slope-intercept

$y = 3x + 10$

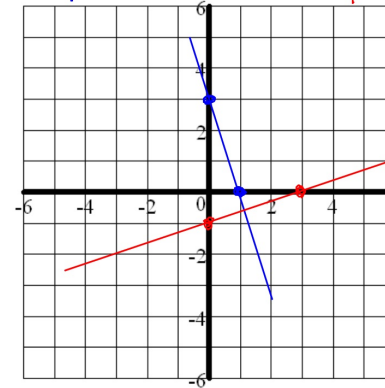
Graph these two equations using the x and y intercepts:

15x + 5y = 15   2x - 6y = 6

x-int = 1   x-int = 3
y-int = 3   y-int = -1

How are these lines related?

Perpendicular   ⊥

Rewrite both of these equations in slope-intercept form.

15x + 5y = 15   2x - 6y = 6

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

Perpendicular Lines have:

• Opposite Reciprocal Slopes

• y-intercept DOESN'T MATTER!

Find the opposite reciprocal of each.

a) $\dfrac{-8}{1}$

Opp Reciprocal= $+\dfrac{1}{8}$

b) 1

Opp Reciprocal= -1

c) $2\dfrac{5}{6} = \dfrac{17}{6}$

Opp Reciprocal= $-\dfrac{6}{17}$

d) $3.5 = 3\dfrac{1}{2} = \dfrac{7}{2}$

Opp Reciprocal= $-\dfrac{2}{7}$

Are these numbers opposite reciprocals?

a) $-\dfrac{4}{5}$ & $1\dfrac{1}{4} = \dfrac{5}{4}$ Yes

b) $\dfrac{16}{12} = \dfrac{4}{3}$ & $-\dfrac{3}{4}$ Yes

c) 0.4 & -2.5 $(0.4)(-2.5) = -1$ Yes

Numbers are opposite reciprocals if their product is -1

Are these lines Parallel, Perpendicular, or Neither?

1. $y = 4x - 1$
   $y = \dfrac{1}{4}x + 8$
   Neither

2. $y = 2x + 3$
   $y = -2x - 5$
   Neither

3. $y = 5x - 2$
   $3x + 15y = -30$
   $y = \dfrac{-30 - 3x}{15}$ (1)
   $y = -2 - \tfrac{1}{5}x$

4. $x = 9 \rightarrow$ Vertical
   $y = 1 \rightarrow$ Horiz
   $\perp$

Write the equation of the line Perpendicular to:

y = -4x + 3

$m = -\dfrac{4}{1}$ $m = +\dfrac{1}{4}$

and passes through the point (-8, 1)

PT-slope
$y - 1 = \dfrac{1}{4}(x + 8)$

Slope-int
$y = \dfrac{1}{4}x + 3$

Use this line: $y = \frac{3}{2}x + 4$

1. Write the equation of the line that is perpendicular
to this line and passes through the point (-6,1)

$$y - 1 = -\tfrac{2}{3}(x + 6) \quad \rightarrow \quad y = -\tfrac{2}{3}x - 3$$

2. Write the equation of the line that is parallel to this
point and passes through the point (8,5)

$$y - 5 = \tfrac{3}{2}(x - 8) \quad \rightarrow \quad y = \tfrac{3}{2}x - 7$$