(16)

(#) Perpendicular + Parallel lines   10/7/15

Slope intercept $y = mx + b$ Standard $Ax + By = C$ form

Parallel lines: since they never intersect
//   have the same slope

Perpendicular lines: intersect at a Right $\angle$
⊥   and have opposite
           reciprocal slope

(Ex) $\dfrac{2}{3} \xrightarrow[\text{recip}]{\text{opp}} \dfrac{-3}{2}$ (Ex) $5 \to \dfrac{-1}{5}$

(Ex 1) Write an equation of a line that
is <u>parallel</u> to $y = 3x - 5$ but
goes through $(6, -2)$ Use point to find
                                  new y intercept

<u>Always</u>
Slope = 3 $y = mx + b$
y intercept = $-2 = (3)(6) + b$
                $-2 = 18 + b$
                $\underline{-18 \quad -18}$ $\boxed{y = 3x - 20}$
                $-20 = b$

(Ex 2) Write an equation of a line that
is <u>perpendicular</u> to $y = -4x + 2$ but
goes through $(4, 5)$

                              $y = mx + b$

(Slope) $m = \dfrac{1}{4}$ $5 = \dfrac{1}{4}(4) + b$
                             $5 = 1 + b$
(y intercept) $\underline{-1 \quad -1}$
     $\left(y = \dfrac{1}{4}x + 4\right)$ $4 = b$

(Ex3) Write an equation on a line
parallel to $2x + 3y = 9$ but
going through $(18, -1)$

$2x + 3y = 9$
$-2x \qquad -2x$

$\dfrac{3y}{3} = \dfrac{-2x + 9}{3}$

$y = -\dfrac{2}{3}x + 3$

$\boxed{y = -\dfrac{2}{3}x + 11}$

$\triangleright \quad m = \dfrac{-2}{3} \quad , (18, -1)$

$y = mx + b$
$-1 = -\dfrac{2}{3}(18) + b$
$-1 = -12 + b$
$11 = b$

(Ex4) Solve for y

(A) $6x + 2y = 10$
$2y = -6x + 10$

$y = \dfrac{-6x + 10}{2}$

$y = -3x + 5$

$-y = +3x - 5$

(B) $-2x - 21y = 14$
$+2x \qquad +2y$

$-21y = \dfrac{2x + 14}{-21}$

$y = \dfrac{-2\cancel{x}}{21} + \dfrac{2}{3}$

(C) $y + 10 = 2x$

$y = 2x - 10$

Vertical lines

$x = ?$

horzontal lines

$y = ?$