Algebra 1                               Name ***Key***

# Writing Equations of Parallel and Perpendicular Lines
Period____

**Write the slope-intercept form of the equation of the line described.**

1) through: $(2, 2)$, parallel to $y = x + 4$

    1. $m = 1$

    2. $\quad 2 = 1(2) + b$
          $2 = 2 + b$
          $\underline{-2 \quad -2}$
          $0 = b$

    3. $\boxed{y = 1x \text{ or } y = x}$

2) through: $(4, 3)$, parallel to $x = 0$

    $x = 4$
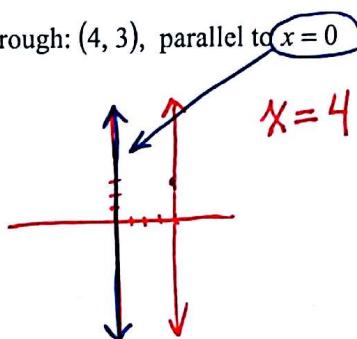
3) through: $(2, -4)$, parallel to $y = 3x + 2$

    1. $m = 3$

    2. $-4 = 3(2) + b$
         $-4 = 6 + b$
         $\underline{-6 \quad -6}$
         $-10 = b$

    3. $\boxed{y = 3x - 10}$

4) through: $(2, -1)$, parallel to $y = -\dfrac{2}{5}x + 3$

    1. $m = -\dfrac{2}{5}$

    2. $-1 = -\dfrac{2}{5}(2) + b$
         $-1 = -\dfrac{4}{5} + b$
         $\underline{+\frac{4}{5} \quad +\frac{4}{5}}$
         $-\dfrac{1}{5} = b$

    3. $\boxed{y = -\dfrac{2}{5}x - \dfrac{1}{5}}$

5) through: $(1, -5)$, perp. to $y = \dfrac{1}{8}x + 2$

    1. $m = -8$

    2. $-5 = -8(1) + b$
         $-5 = -8 + b$
         $\underline{+8 \quad +8}$
         $3 = b$

    3. $\boxed{y = -8x + 3}$

6) through: $(4, -1)$, perp. to $y = x + 2$

    1. $m = -1$

    2. $-1 = -1(4) + b$
         $-1 = -4 + b$
         $\underline{+4 \quad +4}$
         $3 = b$

    3. $\boxed{y = -x + 3}$

7) through: ($\overset{x}{-5}$, $\overset{y}{5}$), <u>perp.</u> to $y = \dfrac{5}{9}x - 4$

1. $m = -\dfrac{9}{5}$

2. $5 = -\dfrac{9}{5}(-5) + b$

   $5 = 9 + b$

   $\underline{-9 \quad -9}$

   $-4 = b$

3. $y = -\dfrac{9}{5}x - 4$

8) through: ($\overset{x}{3}$, $\overset{y}{4}$), <u>perp.</u> to $y = -2x - 4$

1. $m = \dfrac{1}{2}$

2. $4 = \dfrac{1}{2}(3) + b$

   $4 = \dfrac{3}{2} + b$

   $\underline{-\dfrac{3}{2} \quad -\dfrac{3}{2}}$

   $2\dfrac{1}{2} = b$

3. $\boxed{y = \dfrac{1}{2}x + 2\dfrac{1}{2}}$

**Write the <u>standard form</u> of the equation of the line described.**

9) through: ($\overset{x}{4}$, $\overset{y}{4}$), parallel to $y = -6x + 5$

1. $m = -6$

2. $4 = -6(4) + b$

   $4 = -24 + b$

   $\underline{+24 \quad +24}$

   $28 = b$

3. $y = -6x + 28$

4. $\boxed{6x + y = 28}$

10) through: ($\overset{x}{-5}$, $\overset{y}{5}$), parallel to $y = -3x + 3$

1. $m = -3$

2. $5 = -3(-5) + b$

   $5 = 15 + b$

   $\underline{-15 \quad -15}$

   $-10 = b$

3. $y = -3x - 10$

4. $\boxed{3x + y = -10}$

11) through: ($\overset{x}{3}$, $\overset{y}{-2}$), <u>perp.</u> to $y = 5x + 4$

1. $m = -\dfrac{1}{5}$

2. $-2 = -\dfrac{1}{5}(3) + b$

   $-2 = -\dfrac{3}{5} + b$

   $\underline{+\dfrac{3}{5} \quad +\dfrac{3}{5}}$

   $-\dfrac{7}{5} = b$

3. $y = -\dfrac{1}{5}x - \dfrac{7}{5}$

4. $5\left(\dfrac{1}{5}x + y = -\dfrac{7}{5}\right)$

   $\boxed{x + 5y = -7}$

12) through: ($\overset{x}{3}$, $\overset{y}{1}$), <u>perp.</u> to $y = -\dfrac{2}{3}x + 4$

1. $m = \dfrac{3}{2}$

2. $1 = \dfrac{3}{2}(3) + b$

   $1 = \dfrac{9}{2} + b$

   $\underline{-\dfrac{9}{2} \quad -\dfrac{9}{2}}$

   $-\dfrac{7}{2}$ or $-3\frac{1}{2} = b$

3. $y = \dfrac{3}{2}x - \dfrac{7}{2}$ or

   $-2\left(-\dfrac{3}{2}x + y = -\dfrac{7}{2}\right)$

4. $\boxed{3x - 2y = 7}$

**Write the standard form of the equation of each line.**

13) $y = 3x + 1$

   $\underline{-3x \quad -3x}$

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

   $\boxed{3x - y = -1}$

14) $y = -\dfrac{9}{5}x + 3$

   $\underline{+\dfrac{9}{5}x \quad +\dfrac{9}{5}x}$

   $5\left(\dfrac{9}{5}x + y = 3\right)$

   $\boxed{9x + 5y = 15}$