Equations of Parallel and Perpendicular Lines

To finish the unit we will write the equations of parallel and perpendicular lines.
This will require us to steal a slope from a given equation and find a new y-intercept

1) **Find the equation of a line, in slope intercept form,**

a) **parallel to $y = \frac{1}{3}x - 7$ passing thru (27, 11)**

parallel → m = $\frac{1}{3}$ for our new line $y = \frac{1}{3}x + b$ → $11 = \frac{1}{3}(27) + b$

                                          11 = 9 + b   → $y = \frac{1}{3}x + 2$

b) **perpendicular to $y = \frac{-2}{5}x + 7$ passing thru (8, 15)**

perp → m = $\frac{5}{2}$ for our new line $y = \frac{5}{2}x + b$ → $15 = \frac{5}{2}(8) + b$

                                          15 = 20 + b   → $y = \frac{5}{2}x - 5$

c) **perpendicular to $6x - 7y = 14$ with the same y-intercept**

6x – 14 = 7y   → $y = \frac{6}{7}x - \frac{14}{7}$ **perp → m = $\frac{-7}{6}$ for our new line and b = -2**

                                                       $y = \frac{-7}{6}x - 2$

2) **Use pt-slope form to write the equation of a line**
a) **parallel to 11x – 5y – 10 = 0 passing thru (19, -5)**

    11x – 10 = 5y   → $y = \frac{11}{5}x - \frac{10}{5}$ **parallel → m = $\frac{11}{5}$ for our new line**

                                                  $y + 5 = \frac{11}{5}(x - 19)$

b) **perpendicular to 9y + 4x = 11 passing thru the x-intercept of 6x – 5y = 18**

    9y = -4x + 11 $y = \frac{-4}{9}x + \frac{11}{9}$ **perp → m = $\frac{9}{4}$ for our new line**

    6x – 5y = 18   **if y = 0, x = 3** $y + 0 = \frac{9}{4}(x - 3)$

Assignment = worksheet

Parallel and perpendicular Lines Worksheet
Use slope y-intercept form for #1 to 7

1) Find the equation of the line that is parallel to y = 8x – 6 passing through (-4, 12)

2) Find the equation of a line perpendicular to a line of slope 4 passing through (-4, 10)

3) Find the equation of a line perpendicular to y = -2x + 6 passing through (-8, 8)

4) Find the equation of a line parallel to y = -7x + 12 passing through (7, 3)

5) Find the equation of a line perpendicular to $y = \frac{-1x}{3} + 6$ passing through (11, - 6)

6) Find the equation of a line parallel to y = -4x + 10 passing through (1, 10)

7) Find the equation of a line perpendicular to $y = \frac{-4x}{3} + 7$ passing through (2, -10)

8) **Find the equation of a line parallel to 6x + y = 10 passing through (12, -6)**

9) **Find the equation of a line parallel to 7x + y = 10 passing through (14, -8)**

10) **Find the equation of a line perpendicular to 6x + y = 19 passing through (18, 0)**

11) **Find the equation of the line perpendicular to 8x – y = 10 but passing through the y-intercept of 6x + y = 19**

12) **Find the equation of the line perpendicular to 2x – y = 20 but passing through the x-intercept of 19x – 6y = -18.**

13) **Find the equation of the line parallel to 12x – 6y = 19 but passing through the x-intercept of 5x – 3y = -10.**

You should also try Page 374 #20(a), 21, 22, 24 (use point slope form for all of these)