Geometry

Parallel and Perpendicular Lines Day 2 : Writing Line Equations

Steps: 1) Put equation of line in slope-intercept form (**y = mx + b**) and find the slope of the given line

2) Identify the appropriate slope we need:

a) Parallel slope means use **same slope** as the equation's slope (m_1)

b) Perpendicular slope means use **opposite reciprocal** of the equation's slope (m_2)

3) Plug in point (**x,y**) and slope (**m**) into equation **y = mx + b** to solve for **b**.

4) Write new equation in slope-intercept form: **y = mx + b** m = slope, b = y-intercept

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

1) **Through: (-3, -3), parallel to** $y = \frac{7}{3}x - 3$

2) **Through: (2, -4), parallel to** $y = -4x - 2$

3) **Though (-5, -1), perpendicular to** $y = \frac{5}{4}x + 3$

4) **Through (-4, -4), perpendicular to** $y = x - 4$

5) **Through (7, -5), perpendicular to y=5**

Parallel and Perpendicular Lines Day 2 Homework
Write the slope-intercept form of the equation of the line described.

11) through: $(4, 5)$, parallel to $y = \frac{1}{4}x + 3$

12) through: $(0, -5)$, parallel to $y = \frac{9}{4}x - 1$

13) through: $(3, -4)$, parallel to $y = -\frac{5}{3}x$

14) through: $(3, 1)$, parallel to $y = -\frac{4}{3}x - 4$

15) through: $(-2, 4)$, parallel to $y = -\frac{1}{2}x$

16) through: $(-3, -4)$, perp. to $y = -\frac{3}{7}x - 4$

17) through: $(1, 2)$, perp. to $y = -\frac{1}{4}x + 1$

18) through: $(2, -4)$, perp. to $y = \frac{6}{5}x + 4$

19) through: $(2, 5)$, perp. to $y = 5$

20) through: $(-1, 0)$, perp. to $y = -\frac{1}{2}x + 1$

Geometry Parallel and Perpendicular Lines Day 2 : Writing Line Equations Key

Steps: 1) Find the slope of the line given in the problem

2) Identify the appropriate slope we need: by writing equation in slope-intercept form $y = mx + b$

a) Parallel slope means use **same slope** as the equation's slope (m_1)

b) Perpendicular slope means use **opposite reciprocal** of the equation's slope (m_2)

3) Plug in point (**x,y**) and slope (**m**) into equation **y = mx + b** to solve for **b**.

4) Write equation in slope-intercept form: **y = mx + b** m = slope, b = y-intercept

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

1) Through: (-3, -3), parallel to $y = \frac{7}{3}x - 3$ $m_1 = 7/3$

x y

$y = mx + b$

$-3 = \frac{7}{3}(-3) + b$

$-3 = -7 + b$

$4 = b$

$\boxed{y = \frac{7}{3}x + 4}$

2) Through: (2, -4), parallel to $y = -4x - 2$ $m_1 = -4$

x y

$y = mx + b$

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

$-4 = -8 + b$

$4 = b$

$\boxed{y = -4x + 4}$

3) Though (-5, -1), perpendicular to $y = \frac{5}{4}x + 3$ $m_1 = 5/4$ $m_2 = -4/5$

x y

$y = mx + b$

$-1 = \frac{-4}{5}(-5) + b$

$-1 = 4 + b$

$-5 = b$

$\boxed{y = \frac{-4}{5}x - 5}$

4) Through (-4, -4), perpendicular to $y = x - 4$ $m_1 = 1$ $m_2 = -1$

x y

$y = mx + b$

$-4 = -1(-4) + b$

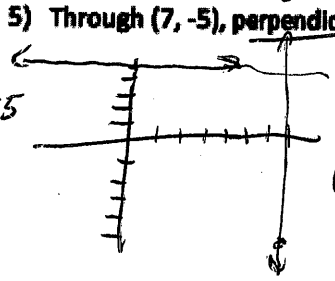
$-4 = 4 + b$

$-8 = b$

$\boxed{y = -1x - 8}$

5) Through (7, -5), perpendicular to y=5

$y = 5$



$\boxed{x = 7}$

Parallel and Perpendicular Lines Day 2 Homework
Write the slope-intercept form of the equation of the line described.

11) through: $(4, 5)$, parallel to $y = \frac{1}{4}x + 3$

x y

$m = 1/4$

$y = mx + b$

$5 = \frac{1}{4}(4) + b$

$5 = 1 + b$

$4 = b$

$\boxed{y = \frac{1}{4}x + 4}$

12) through: $(0, -5)$, parallel to $y = \frac{9}{4}x - 1$

$m_1 = \frac{9}{4}$

x y

$y = mx + b$

$-5 = \frac{9}{4}(0) + b$

$-5 = b$

$\boxed{y = \frac{9}{4}x - 5}$

13) through: $(3, -4)$, parallel to $y = -\frac{5}{3}x$

x y

$m = \frac{-5}{3}$

$y = mx + b$

$-4 = \frac{-5}{3}(3) + b$

$-4 = -5 + b$

$1 = b$

$\boxed{y = \frac{-5}{3}x + 1}$

14) through: $(3, 1)$, parallel to $y = -\frac{4}{3}x - 4$

$m_1 = -4/3$

x y

$y = mx + b$

$1 = \frac{-4}{3}(3) + b$

$1 = -4 + b$

$5 = b$

$\boxed{y = \frac{-4}{3}x + 5}$

15) through: $(-2, 4)$, parallel to $y = -\frac{1}{2}x$

x y

$m = \frac{-1}{2}$

$y = mx + b$

$4 = \frac{-1}{2}(-2) + b$

$4 = 1 + b$

$3 = b$

$\boxed{y = \frac{-1}{2}x + 3}$

16) through: $(-3, -4)$, perp. to $y = -\frac{3}{7}x - 4$

$m_2 = \frac{-3}{7}$

x y

$y = mx + b$

$-4 = \frac{-2}{7}(-3) + b$

$-4 = \frac{6}{7} + b$

$\frac{-34}{7} = b$

$\boxed{y = \frac{-3}{7}x - \frac{34}{7}}$

17) through: $(1, 2)$, perp. to $y = -\frac{1}{4}x + 1$

x y

$m_2 = 4$

$y = mx + b$

$2 = 4(1) + b$

$-2 = b$

$\boxed{y = 4x - 2}$

18) through: $(2, -4)$, perp. to $y = \frac{6}{5}x + 4$

$m_2 = \frac{-5}{6}$

x y

$y = mx + b$

$-4 = \frac{-5}{6}(2) + b$

$-4 = \frac{-10}{6} + b$

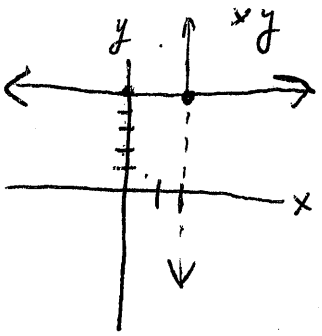
$-17/3 = b$

$\boxed{y = \frac{-5}{6}x - \frac{17}{3}}$

19) through: $(2, 5)$, perp. to $y = 5$

x y

$\cancel{x = 5}$



$\boxed{x = 2}$

20) through: $(-1, 0)$, perp. to $y = -\frac{1}{2}x + 1$

$m_2 = 2$

x y

$y = mx + b$

$0 = 2(-1) + b$

$2 = b$

$\boxed{y = 2x + 2}$