10/22/19 - Warm Up Problem

1. Write the equation of a line that has a slope of -2 and goes through the point (0, 4). Put your final answer in slope-intercept form.

$y = -2x + 4$

2. Write the equation of a line that has a slope of 3/4 and goes through the point (8, -5). Put your final answer in slope-intercept form.

$y - y_1 = m(x - x_1)$

$y + 5 = \frac{3}{4}(x - 8)$

$y + 5 = \frac{3}{4}x - 6$

$-5 \quad -5$

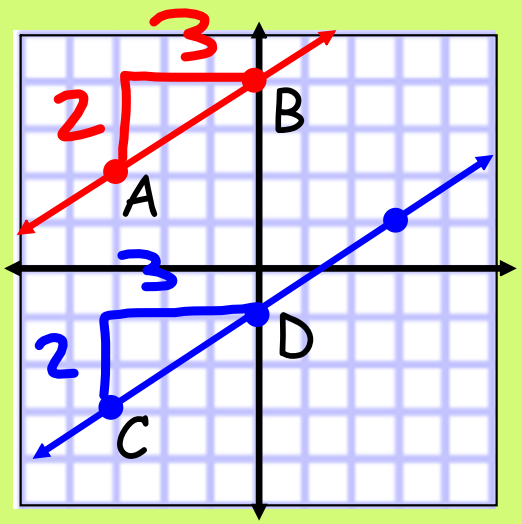
$y = \frac{3}{4}x - 11$

Section 3.8 - Slopes of Parallel and Perpendicular Lines

Goals: Determine if lines are parallel or perpendicular and write equations of lines using given information

Write an equation for each line in slope-intercept form.

$y = mx + b$



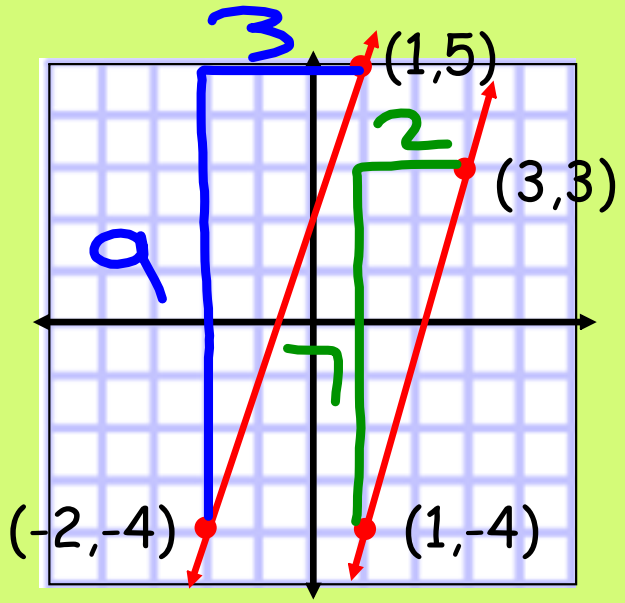
$\overleftrightarrow{AB}$ $y = \frac{2}{3}x + 4$

$\overleftrightarrow{CD}$ $y = \frac{2}{3}x - 1$

Slopes of Parallel Lines

Two nonvertical lines are parallel if and only if they have the same slope.

Any two vertical lines are parallel.



Determine if the two lines are parallel.

$\frac{9}{3} = 3$

$\frac{7}{2} = 3.5$

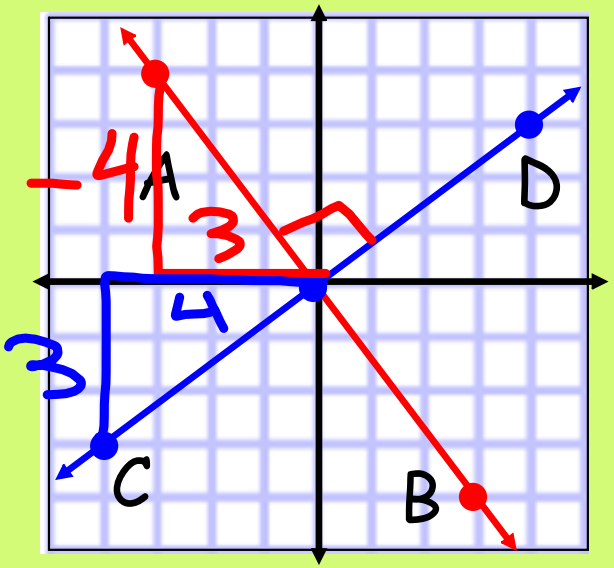
Not Parallel

Write an equation for each line in slope-intercept form.

$y = mx + b$

$\overleftrightarrow{AB}$ $y = -\frac{4}{3}x$

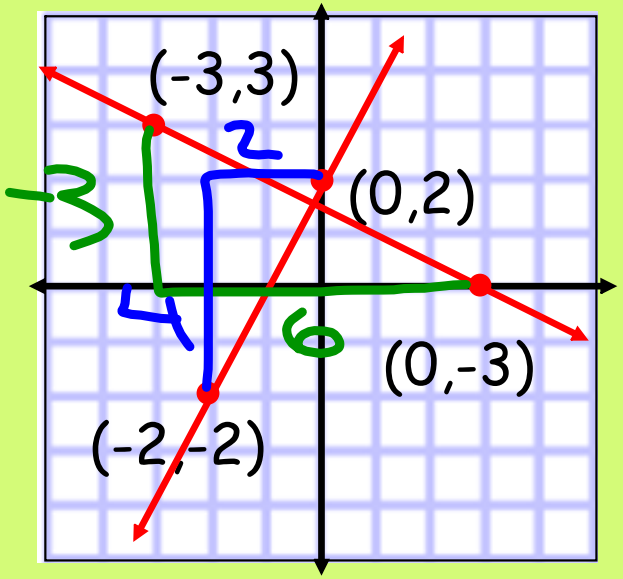
$\overleftrightarrow{CD}$ $y = \frac{3}{4}x$



Slopes of Perpendicular Lines

Two nonvertical lines are perpendicular if and only if they have opposite, reciprocal slopes.

Any horizontal and vertical line are perpendicular.



Determine if the lines are perpendicular.

$\frac{-3}{6} = -\frac{1}{2}$

$\frac{4}{2} = \frac{2}{1}$

Perpendicular

Do this example in your notes.

Are line AB and line CD parallel, perpendicular, or neither?

$X_1 Y_1$ $X_2 Y_2$

A(-8, 3) B(-4, 11)

C(-1, 3) D(1, 2)

$$slope = \frac{y_2 - y_1}{x_2 - x_1}$$

$\overleftrightarrow{AB}$ $\frac{11-3}{-4--8} = \frac{8}{4} = 2$

$\overleftrightarrow{CD}$ $\frac{2-3}{1--1} = \frac{-1}{2}$

Perpendicular

Point-Slope Form

$y - y_1 = m(x - x_1)$

Equations of Parallel and Perpendicular Lines

Write the equation of the line that is parallel to $y = -\frac{1}{2}x + 8$ and contains point P(2,-6).

$y + 6 = -\frac{1}{2}(x - 2)$

$y + 6 = -\frac{1}{2}x + 1$

$-6 \quad -6$

$y = -\frac{1}{2}x - 5$

Do this one in your notes...

Write the equation of the line that is perpendicular to $y = -3x + 9$ and contains point P(-6,5).

$m = \frac{1}{3}$

$y - 5 = \frac{1}{3}(x + 6)$

$y - 5 = \frac{1}{3}x + 2$

$+5 \quad +5$

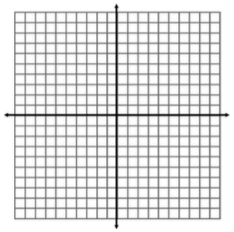
$y = \frac{1}{3}x + 7$

Assignment:

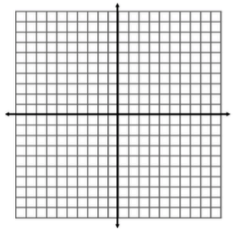
Concept 8 Worksheet - due Friday 10/25
(back)

Graph each equation.

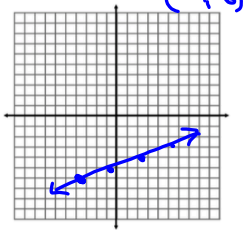
13. $y = -4x + 5$



14. $y = 2(x+1)$



15. $y + 6 = \frac{1}{3}(x+4)$



Find the slope of each line. Determine if line 1 and line 2 are parallel, perpendicular, or neither.

16. Line 1: (-6,1) and (0,-2)
Line 2: (0,3) and (4,1)

17. Line 1: (-5,1) and (1,3)
Line 2: (-4,-2) and (4,2)

18. Line 1: (-3,4) and (1,-2)
Line 2: (-4,0) and (2,4)

Write the equation of the line parallel to the given line that goes through point C. Put your final answer in slope-intercept form.

19. C(0,3); $y = -2x + 1$

20. C(6,1); $y = \frac{1}{3}x$

21. C(6,-2); $y = -\frac{3}{2}x + 6$

Write an equation of the line perpendicular to the given line that also goes through point P. Write your final answer in slope-intercept form.

22. P(6,6); $y = \frac{2}{3}x$

23. P(4,0); $y = \frac{1}{2}x - 5$

24. P(4,4); $y = -2x - 8$