

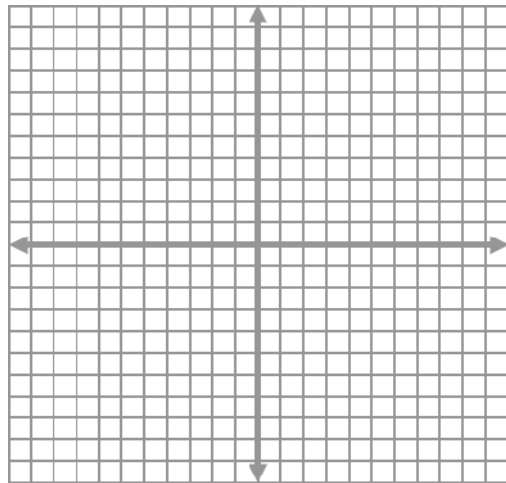
Lesson 5-6: Parallel and Perpendicular Lines

Example 1: Graph each line on the same grid:

a. $y = \frac{1}{2}x - 3$

b. $y = \frac{1}{2}x + 5$

c. $y = -2x - 1$



- d. What do you notice about the graphs of lines *a* and *b*?
- e. What do you notice about the slopes of lines *a* and *b*?
- f. What do you notice about the graphs of lines *a* and *c*?
- g. What do you notice about the slopes of lines *a* and *c*?

5-6 Notes on Parallel and Perpendicular Lines

Parallel lines have the _____ slope as each other.

Perpendicular lines have slopes that are the _____ of each other.
That means, when the 2 slopes are multiplied together it = _____

Example:

SKILL 8: Writing the equation of a line parallel/perpendicular to a given line:

Ex. 1: Write the equation of a line parallel to $y = -1/2 x + 4$ passing through $(-6, 1)$.

Our line is to be parallel to this one so we want our slope to be _____ and we need to use the point $(-6, 1)$.

Use $y = mx + b$ with the slope = _____ and point (_____ , _____)

Ex. 2 Write the equation of a line perpendicular to $y = -1/2 x + 4$ passing through $(-6, 1)$.

Our line is to be perpendicular to this one so we want our slope to be _____ and we need to use the point $(-6, 1)$.

Use $y = mx + b$ with the slope = _____ and point (_____ , _____)

**Slopes of Parallel and Perpendicular Lines**

Lines that are parallel have the same slope.

Lines that are perpendicular have slopes that are negative reciprocals.

In other words, if a line has slope $\frac{a}{b}$, any line that is parallel to it will have slope $\frac{a}{b}$,

and any line that is perpendicular to it will have slope $-\frac{b}{a}$.

Find the slope of each line, then state whether each pair of lines is *parallel*, *perpendicular*, or *neither*. Use the points A(0, 3), B(2, -5), C(-5, 6), D(1, 0), E(-3, -2), and F(4, 5).

1. Line \overline{AE} and line \overline{DF} .

2. Line \overline{AC} and line \overline{AE} .

3. Line \overline{AD} and line \overline{CF} .

4. Line \overline{AC} and line \overline{DF} .

5. Line \overline{BE} and line \overline{AC} .

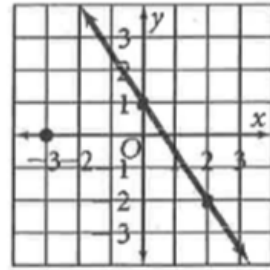
6. Line \overline{AF} and line \overline{ED} .

7. Line \overline{ED} and line \overline{BD} .

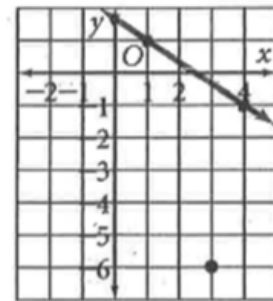
8. Line \overline{BE} and line \overline{AE} .

Notes 5-6: Parallel and Perpendicular Lines

Example 1: Write an equation for the line that is perpendicular to the given line and that passes through the given point.



Example 2: Write an equation for the line that is parallel to the given line and that passes through the given point.



Example 3: Write the equation of a line parallel to the line $2x - 3y = 3$ that passes through the point $(3, 7)$

Example 4: Write the equation of a line perpendicular to the line $-2x + y = 1$ that passes through the point $(4, -1)$

5-6 Book work p 334: 13-18, 27-30, 44-47