Graphs of Linear Functions

GraphLinearFunctions.tns

Name _____

Class _____

Problem 1 – Slope-intercept form of a line

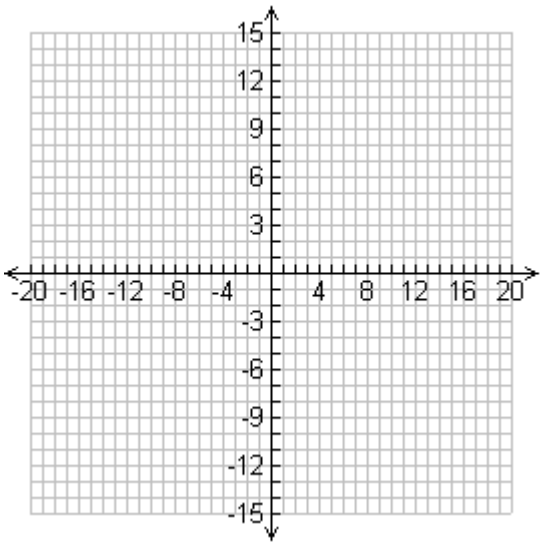
The graph of $y = 3x - 4$ is shown on page 1.3.

- What is the slope of the line? _____
- What is the *y*-intercept of the line? _____

The graph of $y = -\frac{1}{2}x + 3$ is shown on page 1.4.

- What is the slope of the line? _____
- What is the *y*-intercept of the line? _____
- Compare the two equations above to their respective slopes and *y*-intercepts. What do you notice?

- What is the standard slope-intercept form of a line?



- Sketch graphs of each of these equations on the grid to the right.
  - $y = \frac{1}{4}x + 5$
  - $y = -2x - 1$
  - $5y = 4x + 10$
- Now graph the equations on page 1.6.

Problem 2 – Parallel and perpendicular lines

On page 2.2, construct two lines parallel to the given line, one through point *A* and the other through point *B*. Measure the slopes of each, and rotate the original line.

- What is true about the slopes of the parallel lines?

Advance to page 2.3. Construct two lines perpendicular to the given line through points *A* and *B*. Again, measure their slopes, and then rotate the original line.

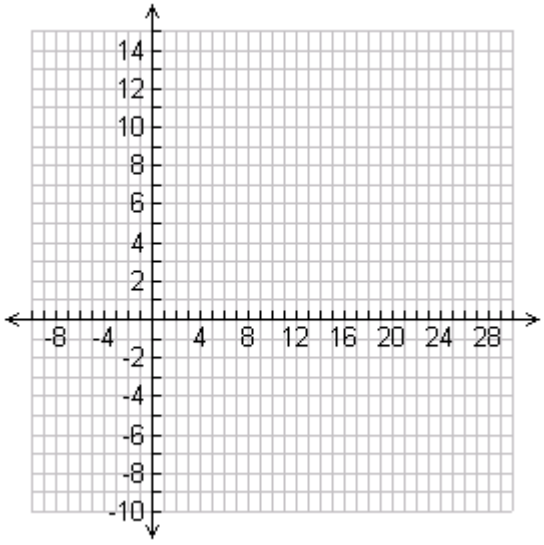
- What is true about the slopes of the perpendicular lines?

- On page 2.5, graph the line that passes through (0, –4) and is parallel to $y = -\frac{2}{3}x + 1$.

  Then, graph the line that passes through (0, –4) and is perpendicular to $y = -\frac{2}{3}x + 1$.

  Finally, graph the line that passes through (6, 2) and is parallel to $y = -\frac{2}{3}x + 1$.

- Sketch graphs of each of these equations on the grid to the right.
  - the line passes through (0, 2) and is parallel to $3y - x = 15$
  - the line passes through (3, 4) and is perpendicular to $y = x + 6$
  - the line has the same *y*-intercept as $y + 6 = 2x$ and is perpendicular to $y = -4x$



Now graph the equations on page 2.6.

Extension

For the figure on page 3.2, find the coordinates of the vertices.

Use the coordinates of the vertices and the *Calculator* application to prove that the quadrilateral is a parallelogram, (both pairs of opposite sides are parallel).

Then prove that the quadrilateral is a rectangle, (has four right angles).