

Section A.6

Section Objectives:

- Recognize a function whose graph is a line algebraically, graphically and from a table.
- Know the definition of the slope of a line. Recognize lines with positive, negative, zero and undefined slope.
- Find the slope of a line from an algebraic expression, a graph and a table.
- Find the equation of a line given two points, or a point and a slope.
- Given either a table of values, and algebraic equation or a graph of a line, find the other two.
- Use both point-intercept, and point-slope forms to find the equation of a line.
- Recognize and find parallel and perpendicular lines.

Practice Problems

1. Determine which of the tables below could represent a linear function. Find the equation of the line and sketch a graph.

x	y
1	5
2	7
4	11
6	15

x	y
1	2
2	3
3	5
4	8

\rightarrow Slopes: $(1,2)$ to $(2,3)$ $\frac{3-2}{2-1} = 1$
 $(2,3)$ to $(3,5)$ $\frac{5-3}{3-2} = \frac{2}{1} = 2$
 Different slopes, not linear

Check all slopes

$(1,5)$ to $(2,7)$ $\frac{7-5}{2-1} = 2$
 $(2,7)$ to $(4,11)$ $\frac{11-7}{4-2} = \frac{4}{2} = 2$
 $(4,11)$ to $(6,15)$ $\frac{15-11}{6-4} = \frac{4}{2} = 2$

slope: 2
 point $(1,5)$ (choose any)
 Eqn: $y - 5 = 2(x - 1)$

all slopes 2 \Rightarrow linear \rightarrow slope is 2

2. Find the equation of the line between $(2,3)$ and $(4,9)$ in both point-slope form and point-intercept form.

3. Graph $2x + 4y = 6$. Find the x -intercepts and y -intercepts both graphically and numerically.

4. Find the equation of a line parallel to $y = 3x + 4$ which passes through the point $(2, 3)$.

5. Find the y intercept of the line perpendicular to $y = 3x - 2$ at the point $(1, 1)$. Illustrate with a graph.

More Practice from Textbook A.6: You should do as many problems from each set (1-8, 9-20, 21-24, 25-46, 47, 48, 49-64), as needed until you are comfortable with these techniques. Problems 49-64 are great practice for more in depth word problems.