Chapter 1

Basic Classes of Functions

Checkpoint Solution

Checkpoint 1.9: Finding the Slope and Equations of Lines

Instruction

Consider the line passing through points $(-3, 2)$ and $(1, 4)$.

(a) Find the slop of the line.

(b) Find an equation of the line in point-slop form.

(c) Find and equation of the line in slope-intercept form.

Solution

(a) The slope of the line is

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4-2}{1-(-3)} = \frac{4-2}{1+3} = \frac{2}{4} = \frac{1}{2}.$$

(b) The point-slope equation for a line passing through the point (x_1, y_1) with slope m is $y - y_1 = m(x - x_1)$. To find an equation for the given line in point-slope form, use the slope $m = \frac{1}{2}$ from part a and choose any point on the line. If we choose the point $(1, 4)$, we get the equation

$$y - 4 = \frac{1}{2}(x - 1).$$

(c) To find an equation for the given line in slope-intercept form, solve the equation in part b for y.

$$y - 4 = \frac{1}{2}(x - 1),$$

$$y - 4 = \frac{1}{2}x - \frac{1}{2},$$
$$y = \frac{1}{2}x - \frac{1}{2} + 4,$$
$$y = \frac{1}{2}x + \frac{7}{2}.$$

Answer

(a) $m = \frac{1}{2}$

(b) $y - 4 = \frac{1}{2}(x - 1)$.

(c) $y = \frac{1}{2}x + \frac{7}{2}$.