

Module 6 Lesson 3**Try This 6 Possible Solutions**

TT 6. *Foundations and Pre-calculus Mathematics 10* (Pearson), questions 20, 22, 24, 25, 26 on page 374

20. a) Since the line is parallel to $y = -\frac{4}{3}x + 1$, the slope of the line is $-\frac{4}{3}$.

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

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

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

$$y + 3 = -\frac{4}{3}x - \frac{20}{3}$$

$$y = -\frac{4}{3}x - \frac{20}{3} - 3$$

$$y = -\frac{4}{3}x - \frac{20}{3} - \frac{9}{3}$$

$$y = -\frac{4}{3}x - \frac{29}{3}$$

b) Since the line is perpendicular to $y = -\frac{4}{3}x + 1$, the slope of the line is $\frac{3}{4}$.

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

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

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

$$y + 3 = \frac{3}{4}x + \frac{15}{4}$$

$$y = \frac{3}{4}x + \frac{15}{4} - 3$$

$$y = \frac{3}{4}x + \frac{15}{4} - \frac{12}{4}$$

$$y = \frac{3}{4}x + \frac{3}{4}$$

22. a) Since the line is parallel to $y - 3 = -\frac{5}{2}(x + 2)$, the slope of the line is $-\frac{5}{2}$.

$$y - 6 = -\frac{5}{2}(x - 2)$$

b) Since the line is perpendicular to $y - 3 = -\frac{5}{2}(x + 2)$, the slope of the line is $\frac{2}{5}$.

$$y - 6 = \frac{2}{5}(x - 2)$$

- 24.** Since the line is perpendicular to $y - 3 = \frac{2}{9}x + 5$, the slope of the line is $-\frac{9}{2}$. Since the two lines intersect on the y -axis, this means that they share a common y -intercept. Rearrange the equation to find the y -intercept of the line.

$$y - 3 = \frac{2}{9}(x + 5)$$

$$y - 3 = \frac{2}{9}x + \frac{10}{9}$$

$$y = \frac{2}{9}x + \frac{10}{9} + 3$$

$$y = \frac{2}{9}x + \frac{10}{9} + \frac{27}{9}$$

$$y = \frac{2}{9}x + \frac{37}{9}$$

The y -intercept is $(0, \frac{37}{9})$. The equation of the perpendicular line is $y = -\frac{9}{2}x + \frac{37}{9}$.

- 25.** Since the line is perpendicular to $y = -\frac{5}{3}x - \frac{25}{3}$, the slope of the line is $\frac{3}{5}$. The equation of the line is $y + 5 = \frac{3}{5}(x + 2)$.

- 26.** Answers may vary. If one line is horizontal and the other is vertical, then their equations will be $y = 5$ and $x = 3$. All other lines will have equations of the following form:

$$y - 5 = m(x - 3) \text{ and } y - 5 = -\frac{1}{m}(x - 3).$$