p. 191, #1-16 all, #25, #26

1. $y = mx + b$

$y = 2x + 9$

An equation is $y = 2x + 9$.

2. $y = mx + b$

$y = 0x + 5$

$y = 5$

An equation is $y = 5$.

3. $y = mx + b$

$y = -3x + 0$

$y = -3x$

An equation is $y = -3x$.

4. $y = mx + b$

$y = -7.5x + 1.5$

An equation is $y = -7.5x + 1.5$.

5. $y = mx + b$

$y = \frac{2}{3}x + (-8)$

$y = \frac{2}{3}x - 8$

An equation is $y = \frac{2}{3}x - 8$.

6. $y = mx + b$

$y = -\frac{3}{4}x - \frac{1}{4}$

An equation is $y = -\frac{3}{4}x - \frac{1}{4}$.

7. Let $(x_1, y_1) = (0, 2)$ and $(x_2, y_2) = (3, 3)$.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - 2}{3 - 0} = \frac{1}{3}$$

Because the line crosses the y-axis at $(0, 2)$, the y-intercept is 2.

So, the equation is $y = \frac{1}{3}x + 2$.

8. Let $(x_1, y_1) = (0, 3)$ and $(x_2, y_2) = (4, 2)$.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2 - 3}{4 - 0} = \frac{-1}{4} = -\frac{1}{4}$$

Because the line crosses the y-axis at $(0, 3)$, the y-intercept is 3.

So, the equation is $y = -\frac{1}{4}x + 3$.

9. Let $(x_1, y_1) = (-3, 4)$ and $(x_2, y_2) = (0, 0)$.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{0 - 4}{0 - (-3)} = \frac{0 - 4}{0 + 3} = \frac{-4}{3} = -\frac{4}{3}$$

Because the line crosses the y-axis at $(0, 0)$, the y-intercept is 0.

So, the equation is $y = -\frac{4}{3}x + 0$, *or* $y = -\frac{4}{3}x$.

10. Let $(x_1, y_1) = (0, -2)$ and $(x_2, y_2) = (2, 2)$.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2 - (-2)}{2 - 0} = \frac{2 + 2}{2 - 0} = \frac{4}{2} = 2$$

Because the line crosses the y-axis at $(0, -2)$, the y-intercept is -2.

So, the equation is $y = 2x - 2$.

11. $m = \dfrac{10 - 1}{0 - 3} = \dfrac{9}{-3} = -3$

Because the line crosses the y-axis at $(0, 10)$, the y-intercept is 10.

So, the equation is $y = -3x + 10$.

12. $m = \dfrac{-5 - 7}{0 - 2} = \dfrac{-12}{-2} = 6$

Because the line crosses the y-axis at $(0, -5)$, the y-intercept is -5.

So, the equation is $y = 6x - 5$.

13. $m = \dfrac{-4-(-4)}{0-2} = \dfrac{-4+4}{0-2}, = \dfrac{0}{-2} = 0$

Because the line crosses the y-axis at $(0, -4)$, the y-intercept is -4.

So, the equation is $y = 0x + (-4)$, *or* $y = -4$.

14. $m = \dfrac{-24-0}{0-(-6)} = \dfrac{-24-0}{0+6} = \dfrac{-24}{6} = -4$

Because the line crosses the y-axis at $(0, -24)$, the y-intercept is -24.

So, the equation is $y = -4x - 24$.

15. $m = \dfrac{1-5.2}{-1.5-0} = \dfrac{-4.2}{-1.5} = 2.8$

Because the line crosses the y-axis at $(0, 5.2)$, the y-intercept is 5.2.

So, the equation is $y = 2.8x + 5.2$.

16. $m = \dfrac{\frac{7}{3} - \frac{1}{3}}{-5-0} = \dfrac{2}{-5} = -\dfrac{2}{5}$

Because the line crosses the y-axis at $\left(0, \frac{1}{3}\right)$, the y-intercept is $\frac{1}{3}$.

So, the equation is $y = -\frac{2}{5}x + \frac{1}{3}$.

25. The slope and y-intercept were substituted incorrectly. The slope is 2. So, $m = 2$. The y-intercept is 7. So, $b = 7$.

$y = mx + b$

$y = 2x + 7$

An equation is $y = 2x + 7$.

26. The coordinates of the points were substituted incorrectly when calculating the slope.

Let $(x_1, y_1) = (0, 4)$ and $(x_2, y_2) = (5, 1)$.

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1 - 4}{5 - 0} = \frac{-3}{5} = -\frac{3}{5}$$

Because the line crosses the y-axis at $(0, 4)$, the y-intercept is 4, which was correct.

$y = mx + b$

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

An equation is $y = -\frac{3}{5}x + 4$.