Topic: Equation of a line in slope-intercept form

Question: Find the equation, in slope-intercept form, of the line that passes through $(0, -2)$ and has a slope of $1/2$.

Answer choices:

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

B $y = \frac{1}{2}x + 2$

C $y = \frac{1}{2}x - 2$

D $y = \frac{1}{2}x - 1$

Solution: C

Use $m = 1/2$ and $(x_1, y_1) = (0, -2)$ in the equation $y - y_1 = m(x - x_1)$ to get

$$y - (-2) = \frac{1}{2}(x - 0)$$

$$y + 2 = \frac{1}{2}x$$

And in slope-intercept form:

$$y = \frac{1}{2}x - 2$$

Topic: Equation of a line in slope-intercept form

Question: Find the equation, in slope-intercept form, of the line that passes through $(-3, -2)$ and $(3, -4)$.

Answer choices:

A $y = -3x - 3$

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

C $y = -3x - 1$

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

Solution: B

First, find the slope.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{-2 - (-4)}{-3 - 3} = \frac{2}{-6} = -\frac{1}{3}$$

Next, use the equation $y - y_1 = m(x - x_1)$. m will be $-1/3$ and either given point can be used for (x_1, y_1). Using the point $(-3, -2)$ we get

$$y - (-2) = -\frac{1}{3}(x - (-3))$$

$$y + 2 = -\frac{1}{3}(x + 3)$$

$$y + 2 = -\frac{1}{3}x - 1$$

In slope intercept form:

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