Topic: Equation of a line in point-slope form

Question: Find the equation of the line.

$$m = -\frac{2}{3}$$

$$(-7,2)$$

Answer choices:

A $y = -\frac{2}{3}x - \frac{17}{3}$

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

C $y = -\frac{2}{3}x + \frac{17}{3}$

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

Solution: D

When we're given a point and a slope, we can use the point-slope formula for the equation of the line, which is

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

where m is the slope and (x_1, y_1) is a point on the line.

We'll just plug in the slope and the point we've been given, and then simplify the equation by solving for y.

$$y - 2 = -\frac{2}{3}(x - (-7))$$

$$y - 2 = -\frac{2}{3}(x + 7)$$

$$y - 2 = -\frac{2}{3}x - \frac{14}{3}$$

$$y = -\frac{2}{3}x - \frac{14}{3} + \frac{6}{3}$$

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

Topic: Equation of a line in point-slope form

Question: Find the equation, in point-slope form, of the line that passes through $(2,3)$ and $(4,11)$. Use $(2,3)$ for (x_1, y_1).

Answer choices:

A $y - 3 = 4(x - 2)$

B $y - 3 = 8(x - 2)$

C $y + 3 = 4(x + 2)$

D $y - 3 = 4(x + 2)$

Solution: A

First, find the slope of the line using the given points.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{11 - 3}{4 - 2} = \frac{8}{2} = 4$$

Next, substitute $(2,3)$ and $m = 4$ into $y - y_1 = m(x - x_1)$.

$$y - 3 = 4(x - 2)$$