

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

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

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

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



**Solution: D**

When we're given a point and the slope, we can use the point-slope form of the equation of a 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 first plug in the slope and the coordinates of the point we've been given, and then simplify the equation by solving for  $y$ .

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

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



**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  $m = 4$  and the coordinates of the point (2,3) into the formula  $y - y_1 = m(x - x_1)$ .

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



**Topic:** Equation of a line in point-slope form

**Question:** Find the equation, in point-slope form, of the line that passes through  $(-3,0)$  and rises 2 in a run of 4.

**Answer choices:**

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

B  $y = 2(x - 3)$

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

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



**Solution: D**

First, find the slope of the line using the rise and run.

$$m = \frac{2}{4} = \frac{1}{2}$$

Next, use  $y - y_1 = m(x - x_1)$ . Use  $(-3, 0)$  as  $(x_1, y_1)$ , and get

$$y - 0 = \frac{1}{2}(x - (-3))$$

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

