

WRITE A LINEAR EQUATION FROM THE Y-INTERCEPT AND A POINT

Linear functions can be represented in slope-intercept form:

$$y = mx + b$$

↑
↑
slope
y-intercept

If you're given the y-intercept and a point on a line, you can write the equation of the line in slope-intercept form.

Try it! Write the equation of the line that has a y-intercept of 3 and goes through the point $(-4, 11)$.

Step 1: Find the slope of the line.

Plug the y-intercept and point into $y = mx + b$, and solve for m :

$$y = mx + b$$

$$y = mx + 3$$

Plug in the y-intercept, 3, for b.

$$11 = m(-4) + 3$$

Plug in the coordinates of the point $(-4, 11)$.

$$11 = -4m + 3$$

Rewrite the equation to make it easier to solve. Then solve for m.

$$8 = -4m$$

$$-2 = m$$

So, the slope of the line is -2 .



Step 2: Write the equation in slope-intercept form: $y = -2x + 3$.

Try it yourself! In each problem, you've been given the y-intercept of a line and a point on that line. Use the y-intercept and point to write the equation of the line in slope-intercept form.

1.

y-intercept: 2

point: (1, 6)

Equation: $y = 4x + 2$

2.

y-intercept: -5

point: (4, 7)

Equation: $y = 3x - 5$

WRITE A LINEAR EQUATION FROM THE Y-INTERCEPT AND A POINT

Keep going! In each problem, you've been given the y -intercept of a line and a point on that line. Use the y -intercept and point to write the equation of the line in slope-intercept form.

3. y -intercept: 4
point: (2, 0)

Equation: $y = -2x + 4$

4. y -intercept: 7
point: (2, -3)

Equation: $y = -5x + 7$

5. y -intercept: -2
point: (-2, 12)

Equation: $y = -7x - 2$

6. y -intercept: -4
point: (-6, 8)

Equation: $y = -2x - 4$

7. y -intercept: -7
point: (-4, 5)

Equation: $y = -3x - 7$

8. y -intercept: 5
point: (4, 10)

Equation: $y = \frac{5}{4}x + 5$

9. y -intercept: -9
point: (3, -11)

Equation: $y = -\frac{2}{3}x - 9$

10. y -intercept: -12
point: (-1, -20)

Equation: $y = 8x - 12$