

Target 4-2: Writing Equations in Slope-Intercept Form Algebra 1
12-4-13

Slope Intercept Form
must have at least 2 of these things to
write an equation

$$y = mx + b$$

slope \rightarrow m \leftarrow y-intercept b
 \nwarrow \nearrow
x and y
(a point)

1. Write an equation in slope intercept form given:

point $(x, y) = (-3, -4)$

point $(x, y) = (-2, -8)$

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

Step 1: Find slope

$$\begin{matrix} (-3, -4) & (-2, -8) \\ x_1 & y_1 & x_2 & y_2 \end{matrix}$$

$$m = \frac{-4 - (-8)}{-3 - (-2)} = \frac{-4 + 8}{-3 + 2} = \frac{4}{-1} = -4 \quad m = -4$$

Step 2: use one point and the slope to
find b

$$(-3, -4) \quad x = -3 \quad y = -4 \quad m = -4$$

$$y = mx + b$$

$$-4 = -4(-3) + b$$

$$-4 = 12 + b$$

$$-12 - 12$$

$$-16 = b$$

Step 3: write the slope intercept form equation

$$m = -4$$

$$b = -16$$

$$y = -4x - 16$$

Answer:

$$y = -4x - 16$$

\uparrow \uparrow
 m b

② point = (3, 4)
point = (6, -2)

Answer:
 $y = -2x + 10$
 ↑ ↑
 m b

Step 1: $m = \frac{y_1 - y_2}{x_1 - x_2} = \frac{4 - (-2)}{3 - 6} = \frac{6}{-3} = -2$

Step 2: $(3, 4)$ $x = 3$ $y = 4$ $m = -2$

$$y = mx + b$$

$$4 = -2(3) + b$$

$$4 = -6 + b$$

$$+6 \quad +6$$

$$10 = b$$

Step 3: $m = -2$ $b = 10$ $y = mx + b$
 $y = -2x + 10$

③ (-2, 1) and (3, 14)
 $m = \frac{14 - 1}{3 - (-2)} = \frac{13}{5}$

$y = \frac{13}{5}x + 6.2$
or $y = \frac{13}{5}x + \frac{31}{5}$

$1 = \frac{13}{5}(-2) + b$ $b = \frac{31}{5}$
 $1 = -\frac{26}{5} + b$
 $\frac{5}{5} + \frac{26}{5} = \frac{31}{5}$

④ Write an equation for the line that passes through an x-intercept of 3 and (7, 2).

↑ this point is (3, 0)

(7, 2) (3, 0) $m = \frac{2 - 0}{7 - 3} = \frac{2}{4} = \frac{1}{2}$

$y = mx + b$
 $0 = \frac{1}{2}(3) + b$
 $0 = \frac{3}{2} + b$
 $-\frac{3}{2} \quad -\frac{3}{2}$
 $-\frac{3}{2} = b$

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

word problems $\left\{ \begin{array}{l} 3 \# \text{'s} = \text{slope} + \text{a point} \\ 4 \# \text{'s} = \text{two points} \end{array} \right.$

Algebra 1
12-4-13

- ⑦ Mike + Meagan turn on the family oven to bake cookies. They notice the following readings:
After 2 min, the oven has reached 180°F
The reading is 290°F after 4 minutes.
Write an equation in slope intercept form that represents the situation.
(minutes, degrees F)

Step 1: two points: $(2, 180)$ $(4, 290)$

$$\text{slope } (m) = \frac{180 - 290}{2 - 4} = \frac{-110}{-2} = 55 = m$$

Step 2: point $(2, 180)$ $m = 55$ $x = 2$ $y = 180$

$$180 = 55(2) + b$$

$$180 = 110 + b$$

$$-110 \quad -110$$

$$70 = b$$

"b" represents
starting temp
of oven

Step 3: $y = mx + b$

$$\boxed{y = 55x + 70}$$

When will the oven reach the goal of 350°F ?

$$350 = 55x + 70$$

$$-70 \quad -70$$

$$\frac{280}{55} = \frac{55x}{55}$$

$$x = 5.09 \text{ minutes}$$

- ⑧ In the 8th wk of school, there are 82 sophomores who have their license. By the 30th week of school, there are now 280 students with their license. Write an equation in slope-intercept form that represents the situation.
(weeks, # of students)

$$(8, 82) \quad (30, 280) \quad m = \frac{280 - 82}{30 - 8} = \frac{198}{22} = 9$$

At 0 weeks, how many sophomores have their license.

$$(8, 82)$$

$$m = 9$$

$$y = mx + b$$

$$82 = 9(8) + b$$

$$82 = 72 + b$$

$$-72 \quad -72$$

$$10 = b$$

$$y = 9x + 10$$

* 10 sophomores have their license at the beginning of the school year.

Hw. p 229 # 5-8 all, 16-21 all, 31-33 all