

# Slope-Intercept Form

## Algebra 1 • Section 5.2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Score: \_\_\_\_\_ / 12

### Quick Review and Helpful Hints

Linear relationships have a constant rate of change. Use slope, intercepts, points, and context to move between equations, tables, graphs, and real-world meanings.

► **Example:** Write the line with slope 2 through (3, 11).

**Work:** Use  $y = 2x + b$ . Substitute the point:  $11 = 2(3) + b$ , so  $b = 5$ .

★ **Answer:**  $y = 2x + 5$

### ◆ Practice Problems

Solve each problem. Show enough work that another student could follow your thinking.

1. Write the slope and intercept of  $y = 3x - 7$ .

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2. Write an equation with slope 5 and intercept  $-2$ .

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3. Write  $2x + y = 9$  in slope-intercept form.

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4. Write  $4x - 2y = 10$  in slope-intercept form.

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5. Find the  $y$ -intercept of  $y = -\frac{1}{2}x + 6$ .

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6. Find the slope of  $y = 7 - 3x$ .

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7. Write the equation with slope  $-4$  through (0, 8).

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8. Does (2, 1) lie on  $y = 3x - 5$ ?

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9. Find the zero of  $y = 2x - 10$ .

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10. Find  $y$  when  $x = -1$  for  $y = -6x + 4$ .

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### ◆ Word Problems

11. A subscription costs \$14 plus \$6 per month. Write the model.

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12. A line starts at 80 and drops 5 each week. Write the model.

\_\_\_\_\_



## Answer Keys

1.  $m = 3, b = -7$

2.  $y = 5x - 2$

3.  $y = -2x + 9$

4.  $y = 2x - 5$

5.  $6$

6.  $-3$

7.  $y = -4x + 8$

8.  $\text{Yes}$

9.  $x = 5$

10.  $10$

11.  $y = 6x + 14$

12.  $y = -5x + 80$

### Step-by-Step Explanations

1. Match it to  $y = mx + b$ : the  $x$ -coefficient is the slope, and the lone number is where it crosses.
2. Just drop your two ingredients into the  $y = mx + b$  recipe and you're done.
3. You only need to free  $y$ , so peel off the  $2x$  by subtracting it from both sides.
4. Shift  $4x$  over, then divide everything by  $-2$  — watch how the signs flip as you go.
5. The intercept is wherever  $x = 0$ , which leaves just the constant sitting there:  $6$ .
6. Mentally swap the order to  $y = -3x + 7$ , and the slope is clearly the  $-3$ .

7. Lucky you — the point has  $x = 0$ , so  $8$  is the intercept and you can write it straight away.
8. Test it by plugging in  $x = 2$ : you get  $3(2) - 5 = 1$ , which matches, so the point is on the line.
9. The zero is where the line hits the  $x$ -axis, so set  $y = 0$  and solve  $0 = 2x - 10$ .
10. Substitute and mind the double negative:  $-6(-1) + 4 = 6 + 4 = 10$ .
11. The  $\$6$  repeats every month so it's your slope; the one-time  $\$14$  is the starting intercept.
12. Begin at  $80$ , and since it's dropping, the weekly change is a negative slope of  $-5$ .



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