

Slope-Intercept Form

Algebra 1 • Section 5.2

Name: _____

Date: _____

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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 $y = 3x - 7$.

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

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

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

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

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

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

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

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

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

◆ Word Problems

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

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. 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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