

# Standard Form of a Linear Equation

Algebra 1 • Section 5.4

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

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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. Rewrite  $y = 2x + 5$  in standard form.

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2. Rewrite  $3x + 2y = 12$  in slope-intercept form.

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3. Find the  $x$ -intercept of  $4x + 2y = 16$ .

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4. Find the  $y$ -intercept of  $5x - y = 10$ .

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5. Rewrite  $y = -\frac{2}{3}x + 4$  in standard form.

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6. Is  $2x + 3y = 6$  in standard form?

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7. Find intercepts of  $6x + 3y = 18$ .

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8. Rewrite  $x = 7$  in standard form.

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9. Rewrite  $y = -4$  in standard form.

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10. Solve  $2x + 5y = 20$  for  $y$ .

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## Word Problems

11. Tickets cost \$6 for students and \$9 for adults. Write revenue equation for \$180.

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12. A recipe uses 2 cups flour per loaf and 3 cups per cake, with 24 cups available. Write standard form.

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## Answer Keys

1.  $2x - y = -5$

2.  $y = -\frac{3}{2}x + 6$

3.  $4$

4.  $-10$

5.  $2x + 3y = 12$

6.  $\text{Yes}$

7.  $x\text{-int } 3; y\text{-int } 6$

8.  $x = 7$

9.  $y = -4$

10.  $y = -\frac{2}{5}x + 4$

11.  $6s + 9a = 180$

12.  $2l + 3c = 24$

### Step-by-Step Explanations

- Standard form wants the variables together, so move  $y$  left and let the constant settle on the right.
- Take  $3x$  to the other side, then divide the whole line by 2 to leave  $y$  standing alone.
- The  $x$ -intercept lives where  $y = 0$ , which collapses things to  $4x = 16$ , so  $x = 4$ .
- Set  $x = 0$  and you're left with  $-y = 10$ ; flip the sign to find  $y = -10$ .
- Multiply through by 3 to wipe out the fraction, then carry  $2x$  to the left side.
- It checks every box — whole-number coefficients with  $x$  and  $y$  teamed up on one side.

- Zero out one variable at a time:  $y = 0$  gives  $x = 3$ , and  $x = 0$  gives  $y = 6$ .
- It's already there — a vertical line fits standard form with  $A = 1$  and no  $y$ -term.
- Nothing to change — a horizontal line works with  $B = 1$  and the  $x$ -term simply absent.
- Move  $2x$  off to the right, then split everything by 5 to get  $y$  by itself.
- Each ticket type earns price times count, and adding those totals gives the full \$180.
- Loaves and cakes each draw from the same flour jar, so their amounts add up to the 24 cups.



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