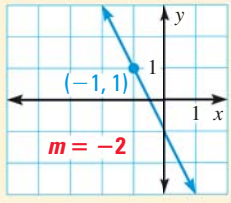
5.4 Write Linear Equations in Standard Form

pp. 311–316

EXAMPLE

Write an equation in standard form of the line shown.



$y - y_1 = m(x - x_1)$ — Write point-slope form.

$y - 1 = -2(x - (-1))$ — Substitute 1 for y_1, -2 for m, and -1 for x_1.

$y - 1 = -2x - 2$ — Distributive property

$2x + y = -1$ — Collect variable terms on one side, constants on the other.

EXERCISES

EXAMPLES 2 and 5 on pp. 311, 313 for Exs. 15–17

Write an equation in standard form of the line that has the given characteristics.

15. Slope: -4; passes through $(-2, 7)$

16. Passes through $(-1, -5)$ and $(3, 7)$

17. COSTUMES You are buying ribbon to make costumes for a school play. Organza ribbon costs \$.07 per yard. Satin ribbon costs \$.04 per yard. Write an equation to model the possible combinations of yards of organza ribbon and yards of satin ribbon you can buy for \$5. List several possible combinations.

5.5 Write Equations of Parallel and Perpendicular Lines

pp. 319–324

EXAMPLE

Write an equation of the line that passes through $(-4, -2)$ and is perpendicular to the line $y = 4x - 7$.

The slope of the line $y = 4x - 7$ is 4. The slope of the perpendicular line through $(-4, -2)$ is $-\frac{1}{4}$. Find the y-intercept of the perpendicular line.

$y = mx + b$ — Write slope-intercept form.

$-2 = -\frac{1}{4}(-4) + b$ — Substitute $-\frac{1}{4}$ for m, -4 for x, and -2 for y.

$-3 = b$ — Solve for b.

An equation of the perpendicular line through $(-4, -2)$ is $y = -\frac{1}{4}x - 3$.

EXERCISES

EXAMPLES 1 and 4 on pp. 319, 321 for Exs. 18–20

Write an equation of the line that passes through the given point and is (a) parallel to the given line and (b) perpendicular to the given line.

18. $(0, 2)$, $y = -4x + 6$

19. $(2, -3)$, $y = -2x - 3$

20. $(6, 0)$, $y = \frac{3}{4}x - \frac{1}{4}$