Key

4-1 Notes: Graphing Equations in Slope-Intercept Form

Slope-Intercept Form

Slope-Intercept Form	$y = mx + b$ (m = slope, b = y-intercept)

Example 1: Write an equation in slope-intercept form for the line with a slope of –4 and a y-intercept of 3.

$m = -4$

$b = 3$

$y = mx + b$

$y = -4x + 3$

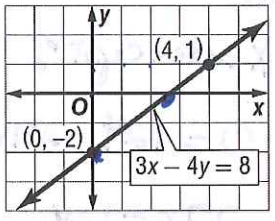
Example 2: Graph $3x - 4y = 8$. It is important to be able to re-arrange linear equations into slope-intercept form.

$3x - 4y = 8$

$-3x \quad -3x$

$\frac{-4y}{-4} = \frac{-3x + 8}{-4} \quad \frac{}{-4}$

$y = \frac{3}{4}x - 2$



Check graph using intercepts

$3x = 8$

$x = \frac{8}{3}$

$= 2\frac{2}{3}$ ✓

$\frac{-4y}{-4} = \frac{8}{-4}$

$y = -2$ ✓

Exercises: Write an equation of a line in slope-intercept form with the given slope and y-intercept.

1. slope: 8, y-intercept –3

$m = 8$, $b = -3$

$y = 8x - 3$

2. slope: –2, y-intercept –1

$m = -2$, $b = -1$

$y = -2x - 1$

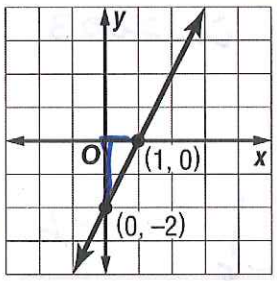
3. slope: –1, y-intercept –7

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

$y = -x - 7$

Write an equation in slope-intercept form for each graph shown.

4.

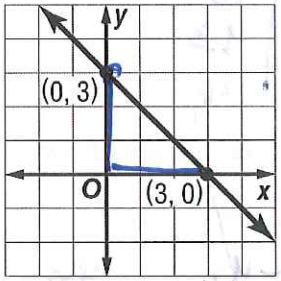


$m = \frac{2}{1}$

$b = -2$

$y = 2x - 2$

5.



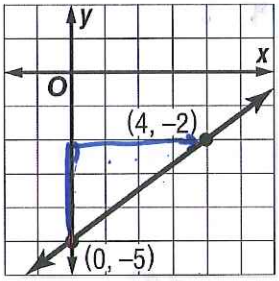
$m = \frac{-3}{3}$

$m = -1$

$b = 3$

$y = -x + 3$

6.



$m = \frac{3}{4}$

$b = -5$

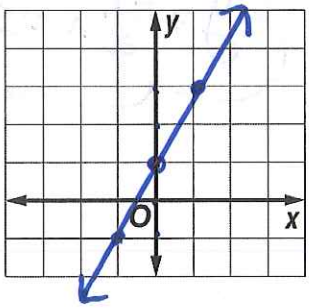
$y = \frac{3}{4}x - 5$

Graph each equation.

7. $y = 2x + 1$

$m = \frac{2}{1}$

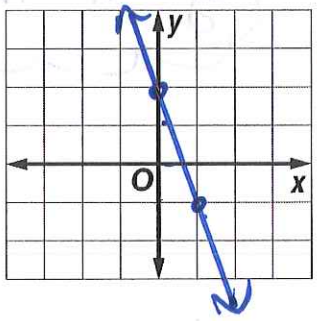
$b = 1$



8. $y = -3x + 2$

$m = \frac{-3}{1}$

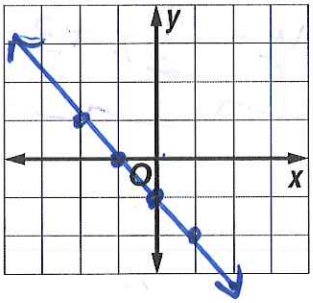
$b = 2$



9. $y = -x - 1$

$m = \frac{-1}{1}$

$b = -1$



Modeling Real-World Data

$m = -27$

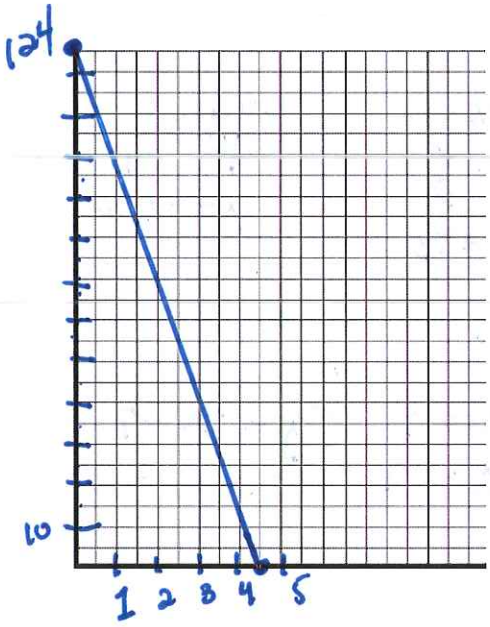
Example: MEDIA Since 1999, the number of music cassettes sold has decreased by an average rate of 27 million per year. There were 124 million music cassettes sold in 1999.

← starting amount

a. Write a linear equation to find the average number of music cassettes sold in any year after 1999.

$y = 124 - 27x$ or $y = -27x + 124$

b. Graph the equation.



y intercept = 124

x intercept:

$0 = 124 - 27x$

$27x = 124$

$x \approx 4.6$

	x	y
1999	0	124
2000	1	97
2001	2	70
2002	3	43
2003	4	16

c. Find the approximate number of music cassettes sold in 2003.

2003 = 4 yrs after 1999

$y = -27(4) + 124$

$y = 16$ million cassettes sold in 2003

Solve the following equations for Slope-Intercept Form. Identify the slope and y-intercept.

EX 1: $2x + 4y = 12$

$-2x \quad -2x$

$\frac{4y}{4} = \frac{-2x + 12}{4}$

Note: $y = -\frac{1}{2}x + 3$

EX 2: $4x - y = 12$

$-4x \quad -4x$

$\frac{-y}{-1} = \frac{-4x + 12}{-1}$

$y = 4x - 12$

EX 3: $6 - 2y = x$

$-6 \quad -6$

$\frac{-2y}{-2} = \frac{x - 6}{-2}$

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