2-2 Skills Practice Linear Relations and Functions

State whether each function is a linear function. Explain.

 y = 3x Yes; it can be written in y = mx + b form. 	 2. y = -2 + 5x Yes; it can be written in y = mx + b form.
3. $2x + y = 10$ Yes; it can be written in y = mx + form.	4. $f(x) = 4x^2$ No; the exponent of x is not 1.
5. $-\frac{3}{x} + y = 15$ No; x is in a denominator.	 6. x = y + 8 Yes; it can be written in y = mx + b form.

7. $g(x) = 8$	8. $h(x) = \sqrt{x} + 3$
Yes; it can be written in	No; <i>x</i> is inside a square root.
v = mx + b form.	

Write each equation in standard form. Identify A, B, and C.

9. $y = x$ $x - y = 0; 1, -1, 0$	10. $y = 5x + 1$ 5x - y = -1; 5, -1, -1
11. $2x = 4 - 7y$ 2x + 7y = 4; 2, 7, 4	12. $3x = -2y - 2$ 3x + 2y = -2; 3, 2, -2
13. $5y - 9 = 0$ 5 <i>y</i> = 9; 0, 5, 9	14. $-6y + 14 = 8x$ 4x + 3y = 7; 4, 3, 7

Find the x-intercept and the y-intercept of the graph of each equation. Then graph the equation using the intercepts.



16. y = -2x0, 0 (0, 0)À 0 2 4 x -2 5, 2 **18.** 2x + 5y = 10**↓**V (0, 2) (5, 0) **x** 0 -2 2 4 6 2

- **1. WORK RATE** The linear equation n = 10t describes *n*, the number of origami boxes that Holly can fold in *t* hours. How many boxes can Holly fold in 3 hours? **30 boxes**
- **2. BASKETBALL** Tony tossed a basketball. Below is a graph showing the height of the basketball as a function of time. Is this the graph of a linear function? Explain.



No, it is not linear because graphs of linear functions are always straight lines. This graph curves.

3. PROFIT Paul charges people \$25 to test the air quality in their homes. The device he uses to test air quality cost him \$500. Write an equation that describes Paul's net profit as a function of the number of clients he gets. How many clients does he need to break even? Paul's profit is p = 25c - 500, if c is the number of clients and p is his profit. He needs 20 clients to break even.

4. RAMP A ramp is described by the equation 5x + 7y = 35. What is the area of the shaded region?



5. SWIMMING POOL A swimming pool is shaped as shown below. The total perimeter is 500 feet.



- a. Write an equation that relates x and y.
 Sample answer: 2x + 2y + 10 = 500
- **b.** Write the linear equation from part **a** in standard form. x + y = 245
- **c.** Graph the equation.



d. Olympic swimming pools are 164 feet long. If this pool is an Olympic pool, what is the value of *y*?81 feet