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## 2-2 Skills Practice <br> Linear Relations and Functions

State whether each function is a linear function. Explain.

1. $y=3 x$

Yes; it can be written in $y=m x+b$ form.
3. $2 x+y=10$

Yes; it can be written in $y=m x+$ form.
5. $-\frac{3}{x}+y=15$

No; $x$ is in a denominator.
7. $g(x)=8$

Yes; it can be written in $y=m x+b$ form.
2. $y=-2+5 x$

Yes; it can be written in $y=m x+b$ form.
4. $f(x)=4 x^{2}$

No; the exponent of $x$ is not 1 .
6. $x=y+8$

Yes; it can be written in $y=m x+b$ form.
8. $h(x)=\sqrt{x}+3$

No; $x$ is inside a square root.

Write each equation in standard form. Identify $A, B$, and $C$.
9. $y=x \quad x-y=0 ; 1,-1,0$
10. $y=5 x+1 \quad 5 x-y=-1 ; 5,-1,-1$
11. $2 x=4-7 y \quad 2 x+7 y=4 ; 2,7,4$
12. $3 x=-2 y-2 \quad 3 x+2 y=-2 ; 3,2,-2$
13. $5 y-9=0 \quad 5 y=9 ; 0,5,9$
14. $-6 y+14=8 x \quad 4 x+3 y=7 ; 4,3,7$

Find the $x$-intercept and the $y$-intercept of the graph of each equation. Then graph the equation using the intercepts.
15.

16. $y=-2 x \quad 0,0$

17. $x+y=5 \quad 5,5$

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## 2-2 Word Problem Practice Linear Relations and Functions

1. WORK RATE The linear equation $n=10 t$ 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 $p=25 c-500$, if $c$ is the number of clients and $p$ is his profit. He needs $\mathbf{2 0}$ clients to break even.
4. RAMP A ramp is described by the equation $5 x+7 y=$ 35. What is the area of the shaded region?

17.5 square units
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: $2 x+2 y+10=500$
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

