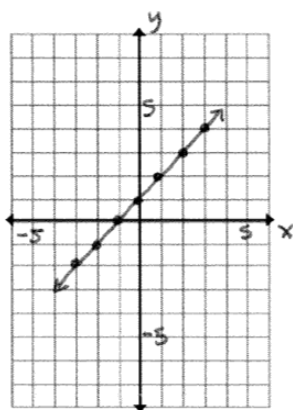


Warmup: Check HW Page 42

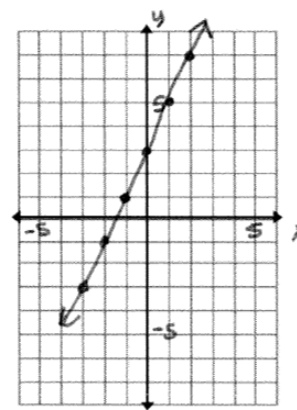
1. $f(x) = x + 1$

x	f(x)
-3	-2
-2	-1
-1	0
0	1
1	2
2	3
3	4



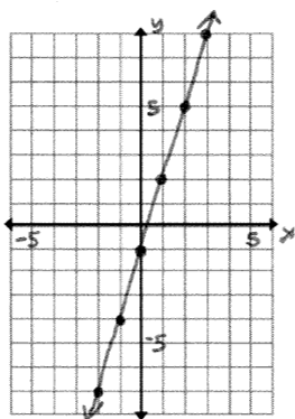
2. $y = 2x + 3$

x	y
-3	-3
-2	-1
-1	1
0	3
1	5
2	7
3	9



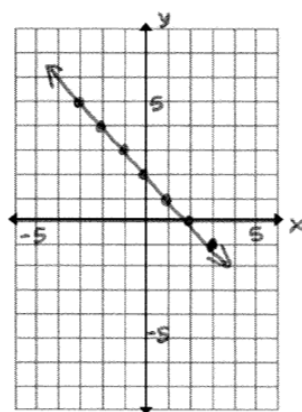
3. $y = 3x - 1$

x	y
-3	-10
-2	-7
-1	-4
0	-1
1	2
2	5
3	8



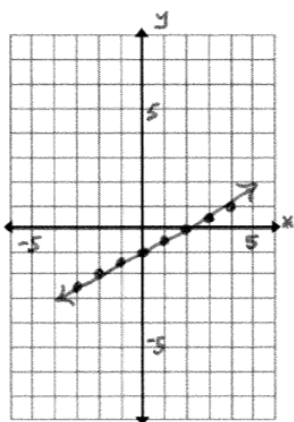
4. $y = -x + 2$

x	y
-3	5
-2	4
-1	3
0	2
1	1
2	0
3	-1



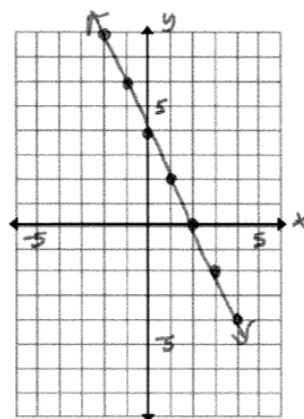
5. $y = \frac{1}{2}x - 1$

x	y
-3	$-2\frac{1}{2}$
-2	-2
-1	$-1\frac{1}{2}$
0	-1
1	$-\frac{1}{2}$
2	0
3	$\frac{1}{2}$



6. $f(x) = -2x + 4$

x	f(x)
-3	10
-2	8
-1	6
0	4
1	2
2	0
3	-2



$$= \frac{1}{2}(3) - 1$$

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Writing a Function Rule

Example 1: Using a table and graph to model a function rule.

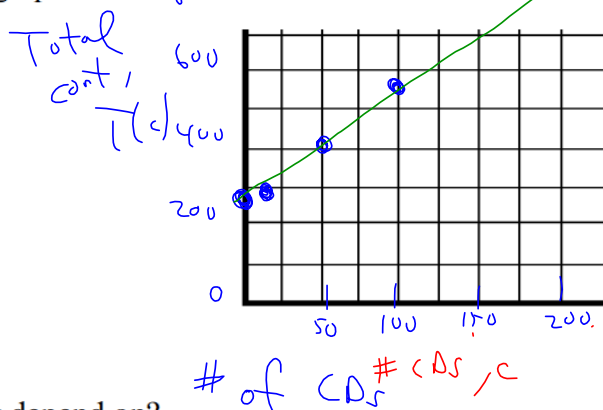
Suppose you and your friends formed a band. Now your band wants to record a CD and sell copies. You find a company that charges \$250 for recording a master CD and designing the art for the cover. But, there is also a cost of \$3 to burn and package each CD. The total cost $T(c)$ depends on the number of CD's (c) burned.

Write a function rule to show the total cost $T(c)$ of the CD's.

$$T(c) = 250 + 3c$$

Now create a table and graph to model the function rule.

c	T(c)
0	250
10	280
50	400
100	550
200	850



What does the total cost depend on?

We call that the independent variable. What changed as the number of CD's increased? cost

We call that the dependent variable.

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✓ Understanding Check:

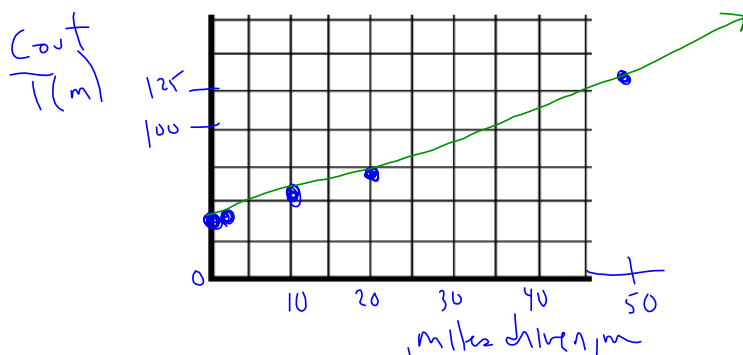
Suppose you need to deliver boxes of your new CD's to several cities. You find a company that charges \$30.00 to rent the truck and \$2.00 per mile (m).

What does the total cost depend on? how far you drive

Write a function rule to model the total cost $T(m)$: $T(m) = 30 + 2m$

Now create a table and graph to model the function rule. Scale and label the graph.

m	$T(m)$
0	30
1	32
10	50
20	70
50	130



What was the independent variable in this problem? miles driven

What was the dependent variable in this problem? cost

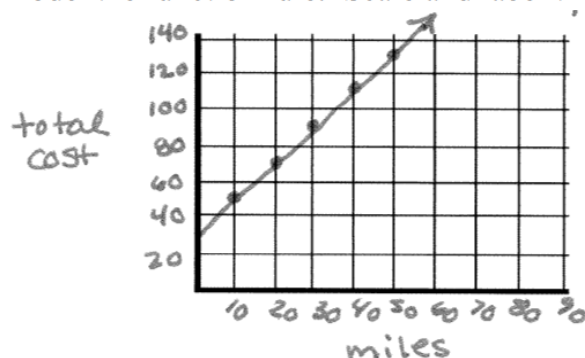
✓ Understanding Check:

Suppose you need to deliver boxes of your new CD's to several cities. You find a company that charges \$30.00 to rent the truck and \$2.00 per mile (m).

What does the total cost (c) depend on? the number of miles^(m) you drive
 Write a function rule to model the total cost: $C = 2m + 30$

Now create a table and graph to model the function rule. Scale and label the graph.

m	c
10	50
20	70
30	90
40	110
50	130



What was the independent variable in this problem? # of miles driven
 What was the dependent variable in this problem? the total cost

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Example 2: Finding the Function Rule

Can you find the function rule for a table of values? You can if you are good at finding patterns. Try to figure out how each output value is related to the input value.

Find the function rule for each table of values.

1.

x	f(x)
-2	-4
-1	-2
0	0
1	2
2	4

$$f(x) = 2x + 0$$

2.

x	y
-2	3
-1	4
0	5
1	6
2	7

$$y = 1x + 5$$

3.

x	f(x)
-2	-7
-1	-4
0	-1
1	2
2	5

$$f(x) = 3x - 1$$

✓ Understanding Check:

a.

x	y
-2	-10
-1	-5
0	0
1	5
2	10

$$y = 5x$$

b.

x	f(x)
-2	-6
-1	-5
0	-4
1	-3
2	-2

$$f(x) = x - 4$$

c.

x	y
-2	1
-1	3
0	5
1	7
2	9

$$y = 2x + 5$$

✓ Understanding Check:

a.

x	y
-2	-10
-1	-5
0	0
1	5
2	10

$$y = 5x$$

b.

x	f(x)
-2	-6
-1	-5
0	-4
1	-3
2	-2

$$f(x) = x - 4$$

c.

x	y
-2	1
-1	3
0	5
1	7
2	9

$$y = 2x + 5$$

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Example 3: Writing a function rule for a situation.

- a. The total distance (d) traveled after (h) hours at a constant speed of 20 mph.

$$d(h) = 20h$$

- b. The height of an object in feet (f), when you know the height in inches (i).

$$f(i) = \frac{i}{12}$$

- c. The profit (p) you make from mowing lawns (l) at \$10 a lawn, less the cost of purchasing the mower for \$100.

$$p(l) = 10l - 100$$

✓ Understanding Check:

1. The pay (p) a worker earns whose hourly wage is \$9.50 an hour (h).

$$p(h) = 9.50h$$

2. The price (p) of purchasing a pizza for \$10 plus \$2 for each topping (t).

$$p(t) = 10 + 2t$$

✓ Understanding Check:

1. The pay (p) a worker earns whose hourly wage is \$9.50 an hour (h).

$$p = 9.50h$$

2. The price (p) of purchasing a pizza for \$10 plus \$2 for each topping (t).

$$p = 2t + 10$$

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Recognizing a Graph as a Pictorial Representation of a Function

Name the independent variable and the dependent variable for each relationship below. Then sketch a graph to represent each relationship described below.

1. The amount of money you would pay for gasoline as you fill your car's tank from almost empty to full.

independent variable: _____

dependent variable: _____



2. The amount of gasoline in the same car as you then drive it 200 miles.

independent variable: _____

dependent variable: _____



✓ Understanding Check:

1. The amount of energy in a fully charged cell phone as someone makes a long four-hour phone call.

independent variable: _____

dependent variable: _____

2. The weight of a puppy from birth to 12 weeks.

independent variable: _____

dependent variable: _____

3. The height of a burning birthday candle over time.

independent variable: _____

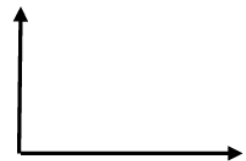
dependent variable: _____



4. The amount of money in a savings account opened with 20 dollars that gets regular deposits of 10 a week.

independent variable: _____

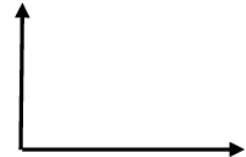
dependent variable: _____



5. The height of a birthday candle unlit over time.

independent variable: _____

dependent variable: _____



✓ Understanding Check:

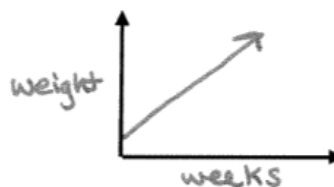
1. The amount of energy in a fully charged cell phone as someone makes a long four-hour phone call.

independent variable: hours
 dependent variable: energy



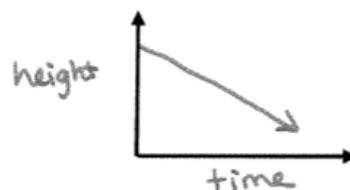
2. The weight of a puppy from birth to 12 weeks.

independent variable: weeks
 dependent variable: weight



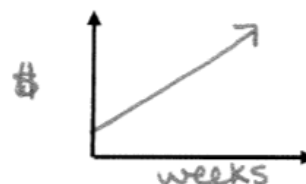
3. The height of a burning birthday candle over time.

independent variable: time
 dependent variable: height



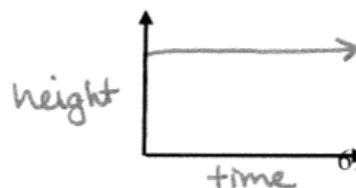
4. The amount of money in a savings account opened with 20 dollars that gets regular deposits of 10 a week.

independent variable: weeks
 dependent variable: \$ or savings



- * 5. The height of a birthday candle unlit over time.

independent variable: time
 dependent variable: height



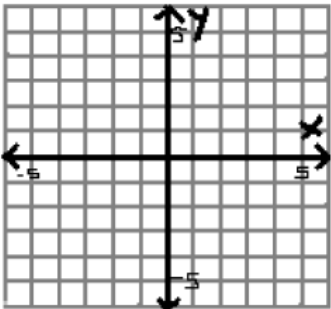
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Exploring Different Types of Functions

Make a table of values and a graph for each function rule. Use $\{-2 \leq x \leq 2\}$ for the domain for each problem.

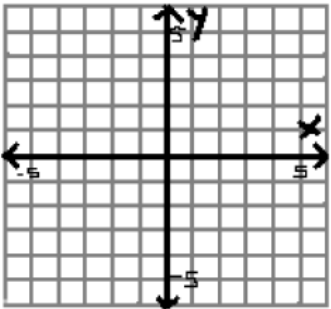
1. $y = x$

x	y



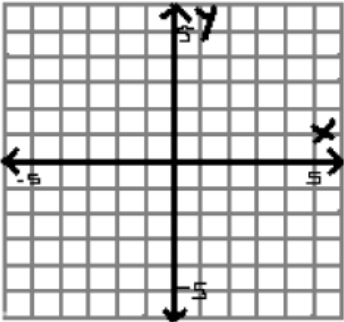
2. $y = x^2$

x	y



3. $y = x^3$

x	y



4. $y = |x|$

x	y

