

In the Heat of the Night

Randy and a group of his friends went camping for a weekend in the Desolation Wilderness. At night the crickets were making so much noise that no one could sleep. Randy remembered from science class that a good way to approximate the temperature was to count how many times a cricket chirps in one minute, multiply this count by $\frac{1}{4}$, and add 40° . The group decided to use Randy's idea to estimate the temperature. They counted 100 chirps in one minute. Randy then computed the approximate temperature: $\frac{1}{4}(100) + 40 = 65^\circ$.

1. Write the formula used to find the approximate temperature.

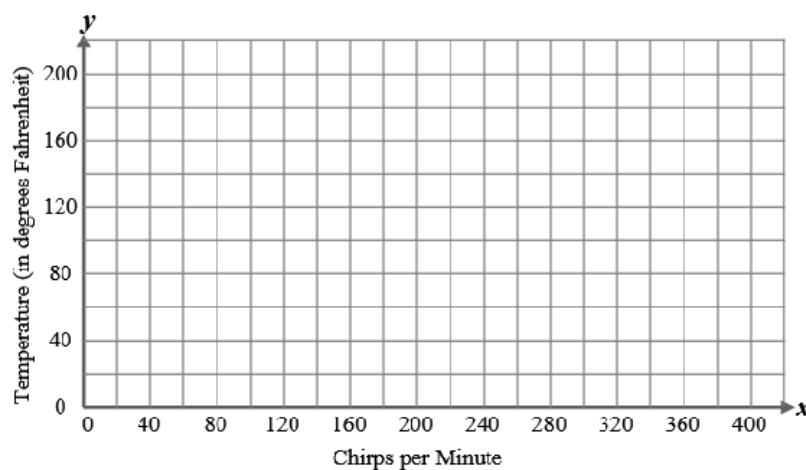
Let t = approximate temperature in degrees Fahrenheit
 n = number of cricket chirps in one minute

Formula:

2. Choose appropriate values for n . (Hint: Look at the x -axis on the graph below.) Then complete the table by calculating each value of t .

# Chirps per Minute (n)									
Temp. in degrees (t)									

3. Now graph these points on the grid provided below.



4. What is the starting point on your graph? What is the rate of change (slope)?
5. Use your graph to find the temperature if you count 300 chirps per minute.
6. Use your graph to estimate the number of chirps per minute you should count if the temperature is 62° .
7. Check the accuracy of your answer by substituting your answer from #6 into the formula. (Show your work.) Did you get 62° ?

All Lined Up

Sandi recently signed up for long distance telephone service from Phones-R-Us. Phones-R-Us charges \$4.00 per month flat rate, plus \$.10 per minute of long distance calling. The algebraic equation (or **formula**) for this situation could be expressed as:

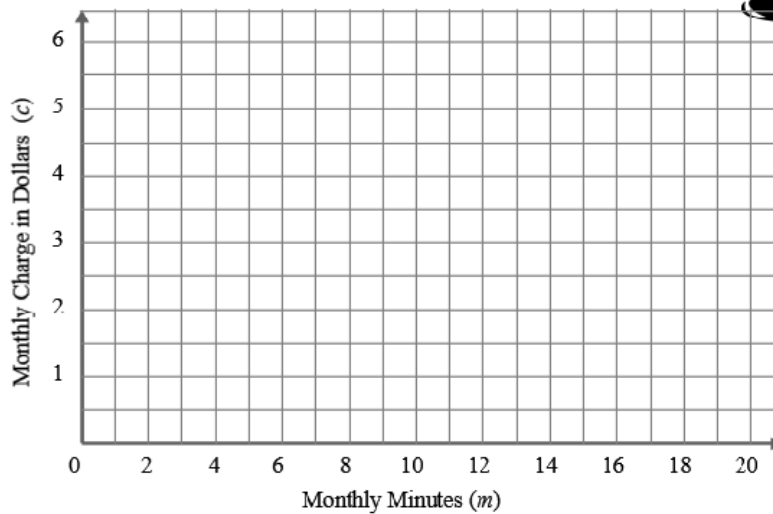
$$c = 0.10m + 4.00.$$

- Complete the following table to determine the charges that Sandi would pay for various minutes of long distance calling by substituting the values in the table for m into the formula and calculating the value for c .

Monthly Minutes (m)	0	2	8	14	20
Monthly Charge (c)					



- Graph these points below:



- Connect the points you graphed above. You have just graphed a **linear formula**. It is called *linear* because the graph forms a straight line. In the formula, m represents the number of monthly minutes of calls and c represents the monthly charge in dollars.
- What is the slope of this graph (rate of change)?
- What is the **starting point**? (If you make zero calls, what is the cost?)
- What does the fourth point on your graph represent?
- Use the formula to find the cost for 25 minutes of monthly calls.

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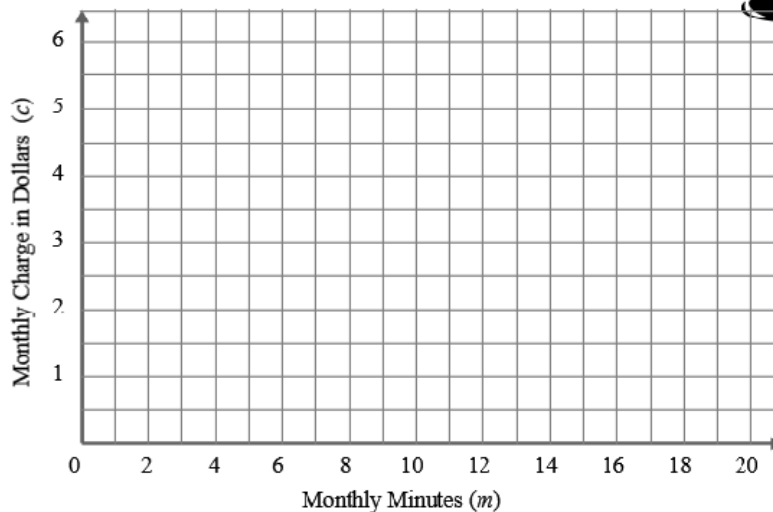
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Problem 3 Identifying Continuous and Discrete Graphs

Farmer's Market A local cheese maker is making cheddar cheese to sell at a farmer's market. The amount of milk used to make the cheese and the price at which he sells the cheese are shown. Write a function for each situation. Graph each function. Is the graph *continuous* or *discrete*?



1 gal of milk makes 16 oz of cheddar cheese.

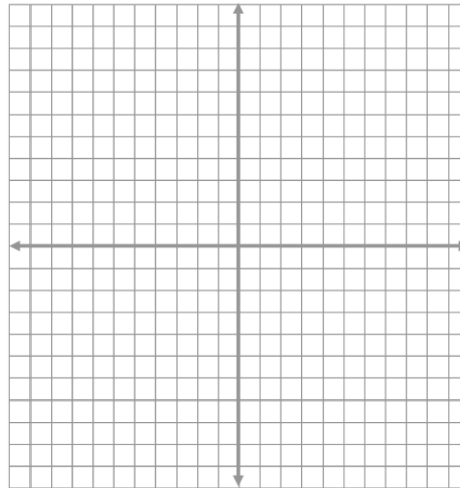
Each wheel of cheddar cheese costs \$9.



The weight w of cheese, in ounces, depends on the number of gallons m of milk used. So $w = 16m$. Make a table of values.

The amount a of money made from selling cheese depends on the number n of wheels sold. So $a = 9n$. Make a table of values.

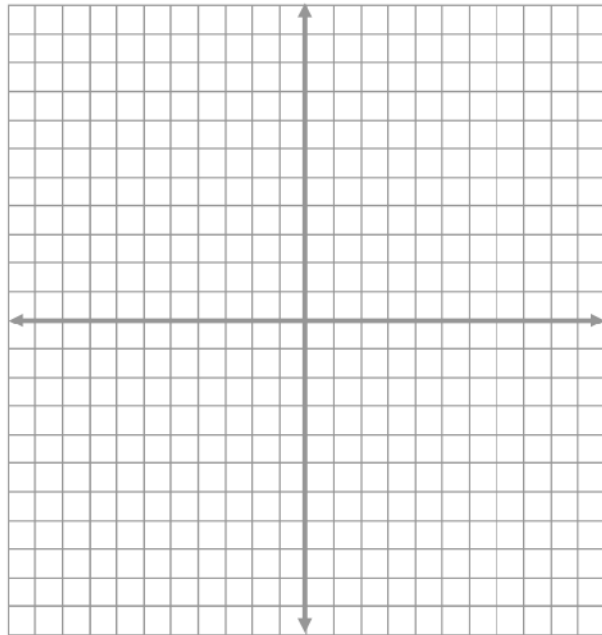
x		y



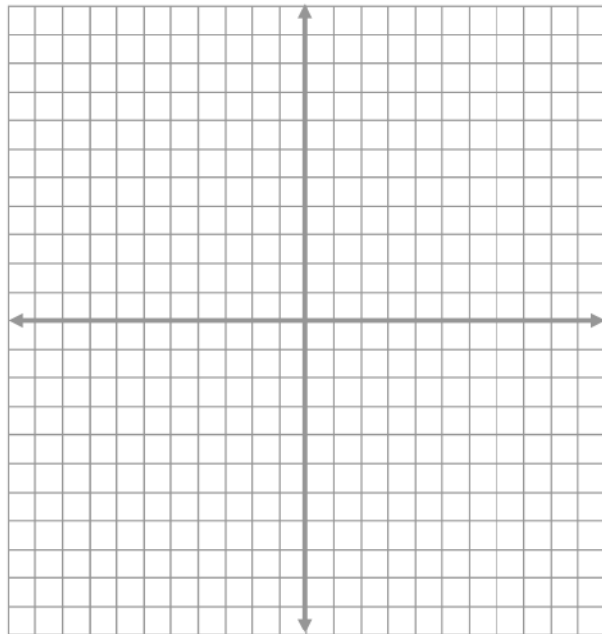
Example 4

What is the graph of each function rule?

x	$y = x - 4$	y



x	$y = -x^2$	y

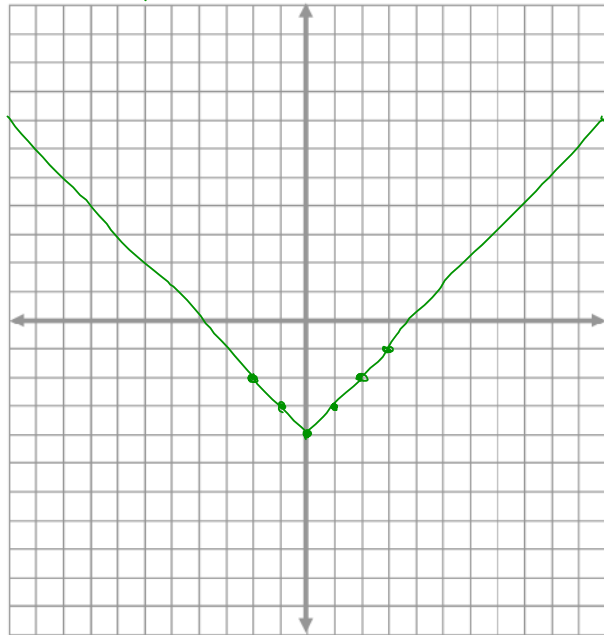


Example 4

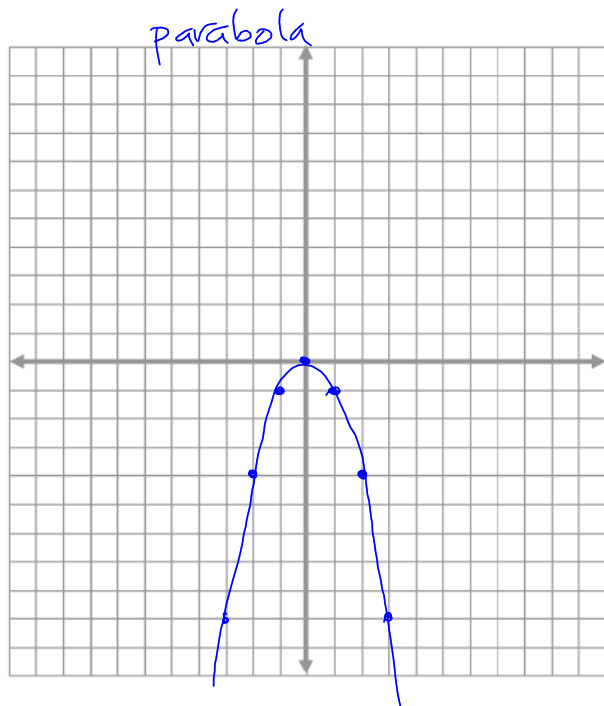
What is the graph of each function rule?

Absolute Value has a V shape

x	$y = x - 4$	y
-2	$ -2 - 4$	-2
-1	$ -1 - 4$	-3
0	$ 0 - 4$	-4
1	$ 1 - 4$	-3
2	$ 2 - 4$	-2
3	$ 3 - 4$	-1
11	$ 11 - 4$	7



x	$y = -x^2$ <small>$-1 \cdot x^2$</small>	y
-2	$-(-2)^2$	-4
-1	$-(-1)^2$	-1
0	$-(0)^2$	0
1	$-(1)^2$	-1
2	$-(2)^2$	-4
3	$-(3)^2$	-9
-3	$-(-3)^2$	-9

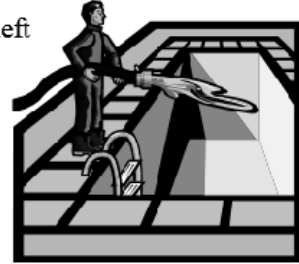


Paul is draining his swimming pool to replace the liner. He knows that his pool contains 15,000 gallons of water. He is draining it with a pump that pumps out 1,000 gallons per hour. We can use x to represent the number of hours pumped and y to represent the number of gallons left in the pool. An algebraic equation (or *formula*) for this situation could be expressed as:

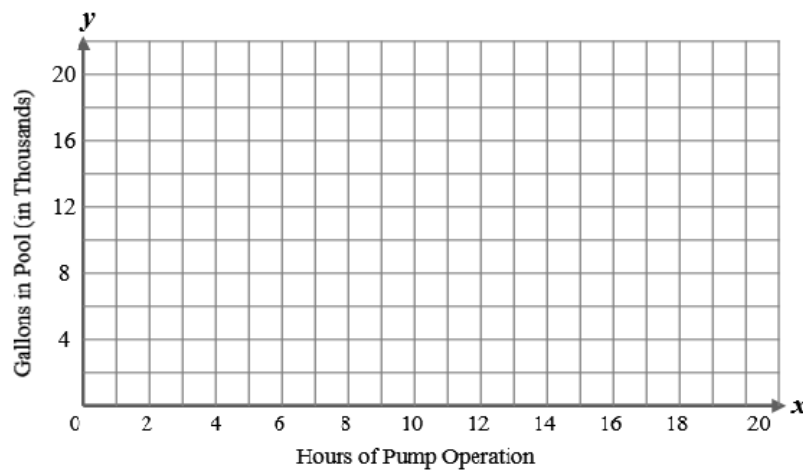
$$y = -1000x + 15000.$$

8. Complete the following table to show the number of gallons of water left in the pool.

# Hours (x)	0	5	10	15
# Gallons Left (y)				



9. Graph the ordered pairs from the above table on the grid below and draw a line through the points.

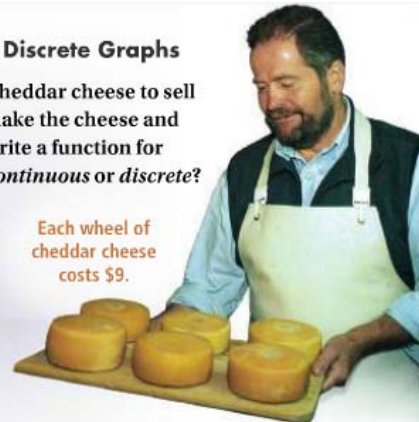


10. Explain what the number 15,000 in the formula represents.
11. Explain what the number $-1,000$ in the formula represents. Why is it negative?
12. Substitute 20 hours into the formula. What is the result? What does it mean?
13. After how many hours should the pool be empty? Show your work.



Problem 3 Identifying Continuous and Discrete Graphs

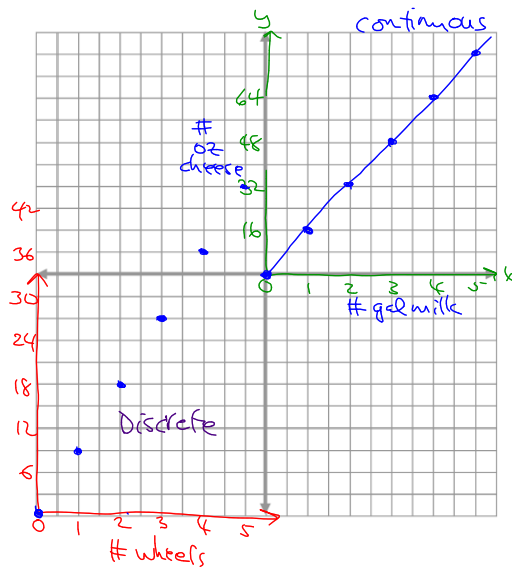
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x gal milk	$y = 16x$	y oz cheese
0	$16(0)$	0
1	$16(1)$	16
2	$16(2)$	32
3	$16(3)$	48
# wheels	$y = 9x$	\$
0	$9(0)$	0
1	$9(1)$	9
2	$9(2)$	18
3	$9(3)$	27



Alg 1 Tuesday Week 8 Warm Up

Skill 3: Solve and Graph Compound Inequalities on a Number Line

$$-4 > y + 2 > -10$$

Skill 4: Solve and Graph Absolute Value Inequalities and Equations

$$4|v - 5| = 16$$

Write a rule that represents the function: (0,0) (1,1) (2,4) (3,9) (4,16)

Skill 2.4: Solve Proportions

A rectangle has a length of 4.5 centimeters and a width of 3.2 centimeters. A similar rectangle has a length of 15 centimeters. What is the width of the other rectangle? Round your answer to the nearest tenth.

$$\frac{l}{w} : \quad \frac{4.5}{3.2} = \frac{15}{x}$$
$$4.5x = 3.2(15)$$
$$\frac{4.5x}{4.5} = \frac{48}{4.5}$$
$$x = 10.\overline{666}$$

The width of the other rectangle is about 10.7 cm.

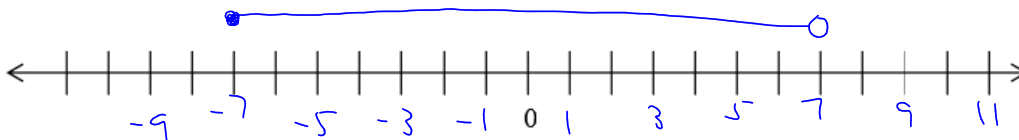
Skill 3.1: Solve and Graph Compound Inequalities on a Number Line

Solve the inequality and then graph the solution on the number line.

$$\frac{-10 \leq 2x + 4 < 18}{-4 \quad -4 \quad -4}$$
$$\frac{-14 \leq 2x < 14}{2} < \frac{14}{2}$$
$$-7 \leq x < 7$$

check $x=0$

$$-10 \leq 2(0) + 4 < 18 ?$$
$$-10 \leq 4 \leq 14 \quad \checkmark$$

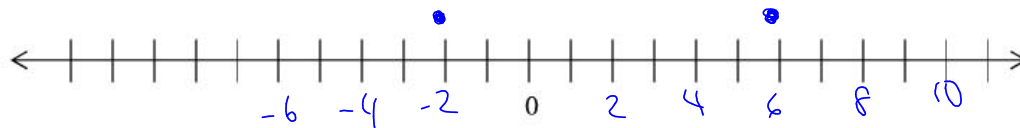


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Skill 4.1: Solve and Graph Absolute Value Inequalities and Equations

Solve and show all your steps. State the solution and then graph the solution set on the number line.

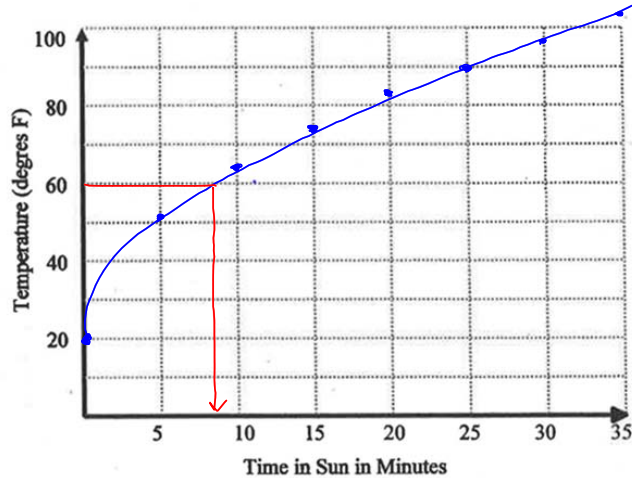
$$\begin{aligned} \frac{|3x-6|}{2} &= \frac{24}{2} \\ |3x-6| &= 12 \\ 3x-6 &= 12 \quad \text{or} \quad 3x-6 = -12 \\ 3x &= 18 \qquad \qquad 3x = -6 \\ \boxed{x=6 \quad \text{or} \quad x=-2} \end{aligned}$$



answers to Mon HW 4-3.C

1. If you eat ice cream on a hot summer day, you have to eat it quickly before it melts, or you have a mess!
 Let the function $f(x) = 14\sqrt{x} + 20$ represent the temperature of the ice cream where x is the time in the sun (in minutes) and $f(x)$ is the temperature of the ice cream (in degrees Fahrenheit.) Complete the table and graph this function.

x	$f(x) = 14\sqrt{x} + 20$	$f(x)$
0		20
5		51
10		64
15		74
20		83
25		90
30		97
35		103

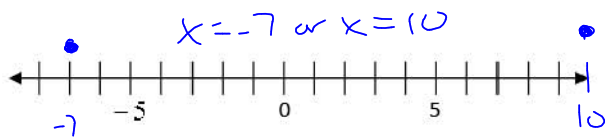


Approximately how long will it take for the temperature of the ice cream to reach 60 degrees?

It will take about 8 minutes for the ice cream to reach 60°.

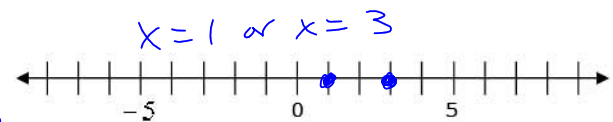
2. Solve and graph on a number line

$$|2x - 3| > 17$$



3. Solve and graph on a number line

$$3|7x - 14| = 21$$



4. Write and solve a proportion: You are riding your bike. It takes you 28 minutes to go 8 miles. If you continue traveling at the same rate, how long will it take you to go 15 miles?

It will take you 52.5 minutes to go 15 miles at this rate.