1.2.4 What can I learn about it?

Function Investigation Challenge

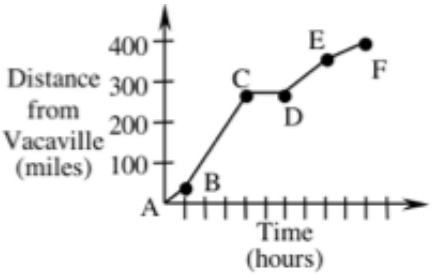
In this lesson, you will have a chance to show off your understanding of investigation as you work with a new function.

1-111. In this activity you will investigate the function $f(x) = \frac{5}{(x^2+1)} - 1$.

a. Take a moment to look over your Learning Log entry entitled "Function Investigation Questions." Are there any questions you should add to your list? Discuss this with your team and make any necessary additions to your Learning Log.

b. Now investigate $f(x) = \frac{5}{(x^2+1)} - 1$ completely. Be sure to make clear summary statements that are justified using multiple representations.

1-112. Recently, Kalani and Lynette took a trip from Vacaville, California to Los Angeles. The graph at right represents their trip. Help (Html5)⇔Help (Java)



a. Explain what each line segment in the graph represents.

b. About how many miles is it from Vacaville to Los Angeles? How do you know?

c. Using the graph shown above, sketch a graph that would represent their *speed* while traveling. Take your time to think this through carefully and be sure to label the axes.

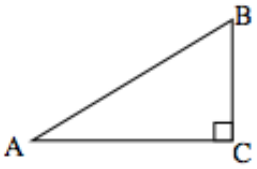
1-113. Solve each equation below for x. Help (Html5)⇔Help (Java)

a. $10 - 2(2x + 1) = 4(x - 2)$

b. $5 - (2x - 3) = -8 + 2x$

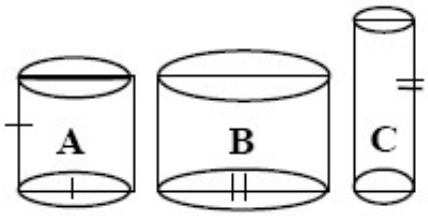
1-114. The right triangle shown at right has a height of ($m\overline{BC}$) of 12 cm, and its area is 60 square cm. Find

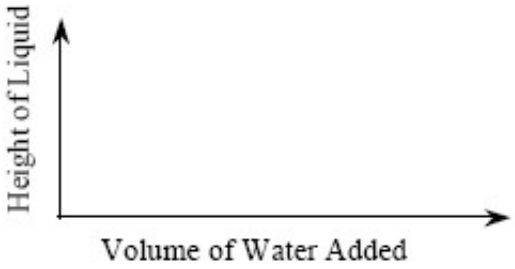
$m\angle B$ and the length of the hypotenuse. Help (Html5)⇔Help (Java)



1-115. The longer leg of a right triangle is three inches more than three times the length of the shorter leg. The area of the triangle is 84 square inches. Find the perimeter of the triangle. Help (Html5)⇔Help (Java)

1-116. Imagine that you are adding water to the beakers shown below (labeled A, B, and C). Sketch a graph for each beaker to show the relationship between the volume of water added and the height of the water in each beaker. Put all three graphs on one set of axes (you may want to use colored pencils to distinguish the graphs). What are the independent and dependent variables? Help (Html5)⇔Help (Java)





1-117. Sketch a few different equilateral triangles. Create multiple representations ($x \rightarrow y$ table, graph, equation) of the function with inputs that are the length of one side of an equilateral triangle and outputs that are its perimeter. Help (Html5)⇔Help (Java)

1-118. Have you ever wondered why so many equations are written with the variables x and y? Suppose you are reaching into a bag that contains all the letters of the English alphabet, and you pull out one letter at random to use as a variable in equations. Help (Html5)⇔Help (Java)

a. What is the probability that you pull out an x?

b. If you got the x, now what is the probability that you pull out a y?