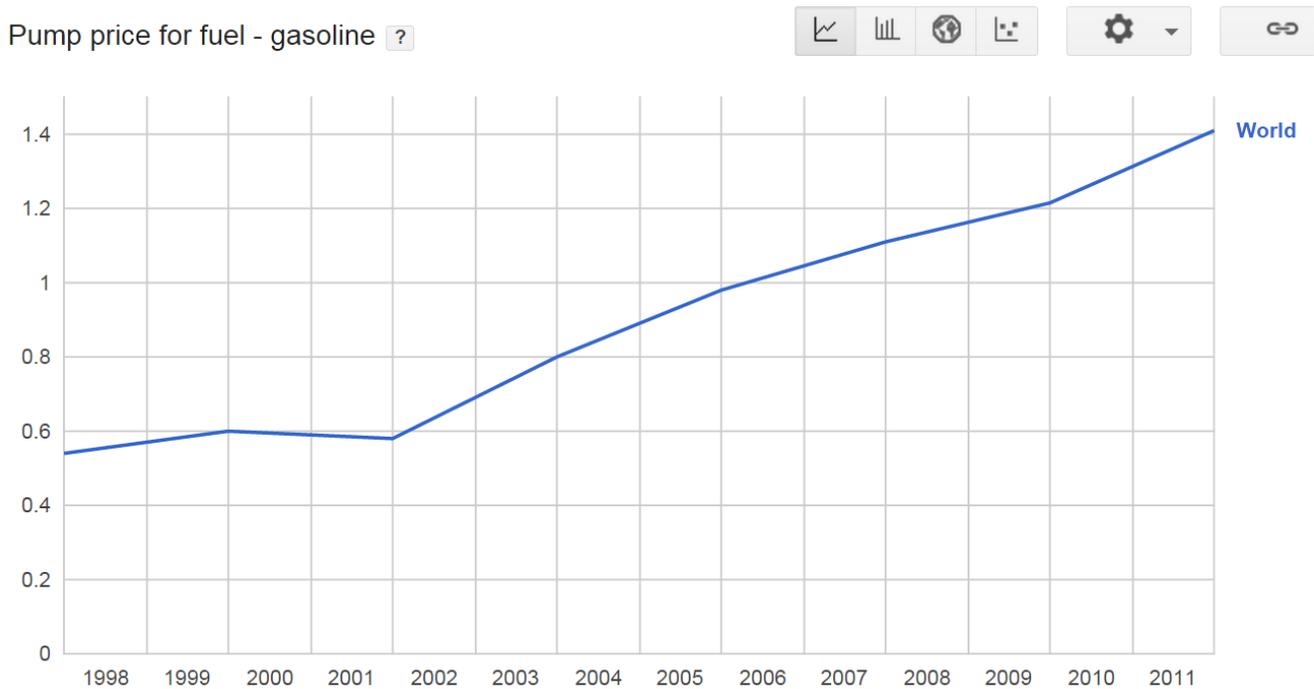


Introduction to Functions

Let's look at a graph of fuel prices (in \$ per liter) over time...



One way to read this graph is by thinking about inputs and outputs. If you input the year 2000, the output is \$0.60 per liter. If you input the year 2012, the output is \$1.41 per liter. Notice that each input (year) gives you only one output (pump price). This is an example of a function.

In general, a **function** relates each input to only one output. Outputs can be observed (as in the pump price above), or they can be generated.

For example, suppose you give me any real number, and I square that number. So, give me a 5, and I square it to get 25. Give me a 7, and I square it to get 49. I'm a function, because each input corresponds with one output! Here's how to write it down mathematically:

$$f(x) = x^2$$

f is the name of the function

x is the input to the function

x^2 calculates the outputs of the function based on the input x

So, $f(5) = 5^2$, which is 25. $f(7) = 7^2$, which is 49. What's $f(9)$? _____ What's $f(-4)$? _____

Ex 1.

Given that $f(x) = 3x^2 + x - 5$, find $f(2)$, $f(0)$, and $f(-3)$.

The _____ of a function is the set of all possible _____.

The _____ of a function is the set of all possible _____.

Here is the same function represented in different ways.

Set of Ordered Pairs	Table	Graph	Arrow Diagram										
$\{(1,3), (2, -1), (3,0), (4,3)\}$	<table border="1"> <thead> <tr> <th>x</th> <th>$f(x)$</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>3</td> </tr> <tr> <td>2</td> <td>-1</td> </tr> <tr> <td>3</td> <td>0</td> </tr> <tr> <td>4</td> <td>3</td> </tr> </tbody> </table>	x	$f(x)$	1	3	2	-1	3	0	4	3		
x	$f(x)$												
1	3												
2	-1												
3	0												
4	3												

The domain of the above function is _____.

The range of the above function is _____.

Practice

1. Given that $f(x) = x^3 + x$, find $f(2)$, $f(0)$, and $f(-3)$.

Q: This is an unusual paragraph. I'm curious how quickly you can find out what is so unusual about it. It looks so plain you would think nothing was wrong with it. In fact, nothing is wrong with it! It is unusual though. Study it, and think about it, but you still may not find anything odd. But if you work at it a bit, you might find out. Try to do so without any coaching!