Functions1b - Function Representations

Standards F-IF.1, F-IF.9

GLOs: #3- Complex Thinker

Math Practices:
-Reason abstractly & quantitatively

HW#4: Func 1b ws

Learning Target(s):
What are the various representations of functions and when should we use each type?

Oct 27-5:42 PM

(erase to show)

In the previous lesson we saw that functions are used to *describe* real world quantities (outputs) that usually change as inputs change. Frequently these quantities are described in words. We also represent these collections of input/output pairs in a more precise manner using:

(erase to show)

- **Graphs** are **visual** representations that easily provide a lot of *information*.
- **Tables** are **numeric** representations that provide *exact* values, but only for a limited number of inputs.
- **Symbolic representations** capture all of the information in a **single formula** and provide an easy method for finding single outputs based on a single input (just evaluate the formula at the input value).

Aug 5-11:29 PM

Symbolic Notation

The notation we would use to designate the Cost (C) for x-number of television sets is C(x), which is read "C of x."

input

output

- If a television costs $400, then the cost for 3 sets would be represented as C(3) = 1200;
- the cost for 5 sets would be C(5) = 2000; and,
- in general, the cost for x sets would be C(x) = 400x.

Aug 5-11:50 PM

1. Suppose we wish to create a function to represent the cost for purchasing songs on iTunes that sell for $1.29 per song. Which of the following (a – g) are accurate representations of this function (x represents the number of songs purchased, P(x) represents the cost for purchasing x-many songs)? For each representation that fails, please explain why it fails.

a. P(x) = 1.29x, where x ≥ 0.

$P(0) = 1.29(0)$

$P(0) = 0$ ☺

b. P(x) = x + 1.29, where x ≥ 0.

$P(0) = (0) + 1.29$

$P(0) = 1.29$ ☺

c.

x	P(x)
0	0
1	1.29
2	2.58
3	3.87
4	5.16

d.

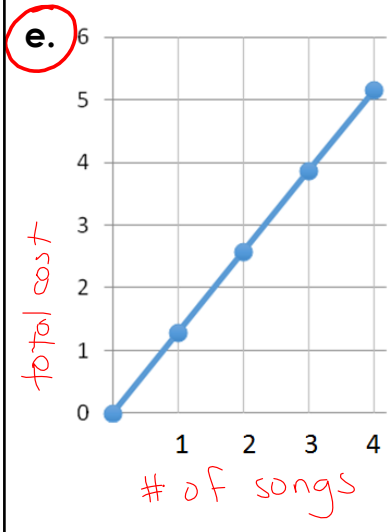
x	P(x)
5	6.25
10	12.5
15	18.75
20	25
25	31.25

$P(x) = 1.29x$

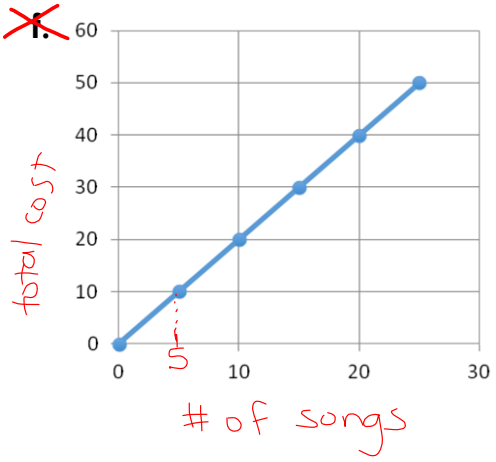
$P(10) = 1.29(10)$

$P(10) = 12.90$

e.



f.



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Reflection

Of the problems (a-g) above that you selected as correct representations for the situation (buying iTunes songs at $1.29 per song),

a) which representation(s) would be easiest to use to determine the price for 3 songs? Explain.

symbolic rep - all you do is plug 3 in for x.
table - the input 3 is in table
graph (for estimate)

b) which representation(s) above would be easiest to use to determine the price for 35 songs? Explain.

symbolic rep - all you do is plug 35 in for x.

c) What are some of the advantages to having four different representations for the same function?

- Double check your work with multiple representations.
- Some representations are easier to use than others.

2. The symbolic representations of the functions from question 2 are the following:

$f(x) = 2x - 96$ $g(x) = -5x$ $h(x) = 5000x - 1450$

$j(x) = -.02x + .8$ $k(x) = 2^x$

Determine each of the following values.

a. $f(100)$

$f(100) = 2(100) - 96$

$= 200 - 96$

$f(100) = 104$

b. $g(30)$

$g(30) = -5(30)$

$g(30) = -150$

c. $h(1)$

$h(1) = 5000(1) - 1450$

$= 5000 - 1450$

$h(1) = 3550$

d. $j(100)$

$j(100) = -0.02(100) + 0.8$

$= -2 + 0.8$

$j(100) = -1.2$

"j of 100 equals -1.2"