

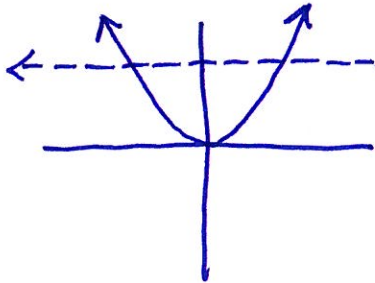
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Chapter 10: Tasks #1-7 (IC)

Name: Key
Date: _____ Period: _____

Task #1:

Gwen and Rita are discussing the characteristics of certain functions. Rita claims that the equation $y = x^2$ does not model a function because the line $y = 5$ intersects the graph of the equation in two points. Gwen disagrees. How might she present her case to Rita?



horizontal line test (indicates whether a function is one-to-one)

Rita is confused 😞. The equation $y = x^2$ passes the vertical line test & therefore is a function.

Task #2:

A box of Crunchy Granola is selling for \$2.98 at the Healthy Grocery Mart. The inflation rate for granola has been noted to be 4% annually.

1. What do you expect the price to be a year from now? \$3.10

2. What would you expect the price to have been a year ago? \$2.86

3. Write an equation that models this information. Does this represent exponential growth or decay?

$$y = 2.98(1.04)^x$$

4. Assuming a steady inflation rate, in what year would you expect the price of a box of Crunchy Granola to be more than \$3.50?

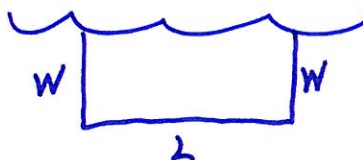
(table)

In year 5, it will surpass \$3.50.

Task #3:

Sam and Jenny have 1,200 feet of fence. They would like to enclose as large a rectangular plot of land as possible. Their farm lies along a river, and they will not need to put up a fence along that side of their land. What is the maximum area that they can get from the length of fence that they have?

$$A = L * W$$
$$L + 2W = 1200;$$
$$L = 1200 - 2W$$



$$A = (1200 - 2W) * W$$

$$A \leq 180,000 \text{ ft}^2$$



Task #4:

Jaden is exploring the characteristics of small boxes. He is creating boxes using one sheet of construction paper for each box. He makes the box by cutting out squares in 1-inch increments from the four corners of the paper and then folding up the edges. If the paper that Jaden is using is 9 inches by 12 inches, what are the sizes of the boxes that he is designing?

Create a table of values that records the length, width, and volume of all the boxes you think Jaden could create in this way.

side of square cutout (s)	length of box ($12-2s$)	width of box ($9-2s$)	Volume of box $s(12-2s)(9-2s)$
1	10	7	70 in^3
* 2	8	5	80 in^3
3	6	3	54 in^3
* 4	4	1	16 in^3

What is the length of the square cutouts for the box with the greatest volume?

2 in. cutouts

With the smallest volume?

4 in. cutouts

If s represents the side of the square that Jaden cuts, how could he represent the volume of the resulting box in terms of s ?

$$V = s(12-2s)(9-2s)$$

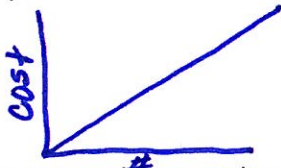
Task #5:

Lily found the price of table tennis balls listed on the Internet at \$4.75 for a package of 6 balls. Shipping and handling was listed at \$1.00 per package.

1. Write an equation that represents the total cost for different numbers of packages of table tennis balls.

$$C = 4.75(n) + 1.00$$

2. Sketch a graph of this relationship.



↑ (cost)
↑ (# of packages)

3. If you shift your graph up a value of \$0.50, does this mean the price per package increased, or the shipping price increased?

Shipping price increased by \$0.50.

4. Write a new equation for the situation in question 3.

$$C = 4.75(n) + 1.50$$

Task #6:

Many newspapers consist of large sheets of paper that are folded in half to form the pages. For example, a newspaper that is made from 2 large sheets of paper would have 8 pages. Consider the following questions about newspapers created in this way.

1. If there were 10 sheets of paper, how many pages would there be?

$\frac{2 \text{ sheets}}{8 \text{ pages}} \text{ so } \frac{10 \text{ sheets}}{40 \text{ pages}}$

2. What page numbers would appear in the center, or on the innermost sheet of the newspaper?
What is the sum of the numbers?

$20 ; 21 ; 41$

3. What is the sum of the page numbers that would appear on ANY one side of ANY sheet of the newspaper?

$N \text{ sheets of paper} = 4N \text{ pages}$
 $\text{Sum of page \#s on one side of 1 sheet} = \underline{4n+1}$

4. What is the sum of all the pages of the newspaper?

$820 \quad (2(10))(4(10+1))$

5. Write a rule in words or symbols that would give the sum of the pages for a newspaper with N sheets of paper.

$2N(4N+1)$
 \uparrow
 # of sides of each sheet

Task #7:

Abby and her brother Harry like to play a game called "U-Say, I-Say." Harry gives the "U-Say" number (an integer between -10 and +10). Abby has a secret rule she performs on the number that results in the "I-Say" number. Complete the table below by giving the missing "I-Say" values. Then describe Abby's rule in words and symbols.

U-Say	3	0	-4	1	2	5
I-Say	11	2	-10	5	8	17

Abby's rule : $I\text{-say} = 3 \cdot U + 2$