Victim: *Mr. Solutions*

1. Give *one example* of each of the following: (**5** /5)   *Inspiring work once again!!* $\frac{21}{21}$

   (a) Expression _____ $-5x - 1$ ✓

   (b) Equation that is Solved for the Unknown _____ $-5x - 1 = -3$ ✓

   (c) Equation that Expresses a Mathematical Relationship _____ $A = \pi r s + \pi r^2$ ✓

   (d) Identity _____ $a(x+y) = ax + ay$ ✓

   (e) A Value that Satisfies the Equation $x^2 = 10000$ _____ $x = 100$ or $x = -100$ ✓

2. The *perimeter* of a rectangle is 280 m. If the length of the rectangle is *triple* its width, find the dimensions of the rectangle. (**9** /9)

   (a) Construct an algebraic model by using the phrase "the length of the rectangle is *triple* its width."

Quantity	Representation	Explanation
Width	w ✓	The width is unknown.
Length	$3w$ ✓	The length is triple the width.

   (b) Translate the following sentence into an equation. *Do not solve* the equation yet! You will do that in part (c).

   "The *perimeter* of a rectangle is 280 m."

   $w + 3w + w + 3w = 280$ ✓✓ ✓

   (c) Solve the equation.

   $w + 3w + w + 3w = 280$

   $\therefore\ 8w = 280$ ✓

   $\therefore\ \dfrac{8w}{8} = \dfrac{280}{8}$ ✓

   $\therefore\ w = 35$ ✓

   (d) State a conclusion.

   The width is 35 m and the length is $3(35) = 105$ m ✓

3. Mr. Nolfi rewarded four of his students by giving them gummi bears (a type of candy). He decided to divide the gummi bears among the students in the following way:

   - The first student was given 100 gummi bears *more than* $\dfrac{1}{2}$ of the total number of gummi bears.

   - The second student was given 200 gummi bears *more than* $\dfrac{1}{4}$ of the total number of gummi bears.

   - The third student was given 300 gummi bears *more than* $\dfrac{1}{8}$ of the total number of gummi bears.

   - The fourth student was given 600 gummi bears *more than* $\dfrac{1}{16}$ of the total number of gummi bears.

   How many gummi bears were there altogether? Write your solution on the next page. (**7** /7)

Let g represent the total number of gummi bears. Then,

- Student 1 received $\frac{1}{2}g + 100$ gummi bears
- Student 2 received $\frac{1}{4}g + 200$ gummi bears
- Student 3 received $\frac{1}{8}g + 300$ gummi bears
- Student 4 received $\frac{1}{16}g + 600$ gummi bears

$$\left(\begin{array}{c}\text{\# given}\\\text{to student 1}\end{array}\right) + \left(\begin{array}{c}\text{\# given}\\\text{to student 2}\end{array}\right) + \left(\begin{array}{c}\text{\# given to}\\\text{student 3}\end{array}\right) + \left(\begin{array}{c}\text{\# given to}\\\text{student 4}\end{array}\right) \text{ is the total \#}$$

$$\frac{1}{2}g + 100 + \frac{1}{4}g + 200 + \frac{1}{8}g + 300 + \frac{1}{16}g + 600 = g$$

$$\therefore \frac{1}{2}g + \frac{1}{4}g + \frac{1}{8}g + \frac{1}{16}g + 100 + 200 + 300 + 600 = g$$

$$\therefore \frac{1}{2}g + \frac{1}{4}g + \frac{1}{8}g + \frac{1}{16}g + 1200 = g$$

$$\therefore \frac{16}{1}\left(\frac{1}{2}g\right) + \frac{16}{1}\left(\frac{1}{4}g\right) + \frac{16}{1}\left(\frac{1}{8}g\right) + \frac{16}{1}\left(\frac{1}{16}g\right) + 16(1200) = 16g$$

$$\therefore 8g + 4g + 2g + g + 19200 = 16g$$

$$\therefore 15g + 19200 = 16g$$

$$\therefore 15g + 19200 - 16g = 16g - 16g$$

$$\therefore -1g + 19200 = 0$$

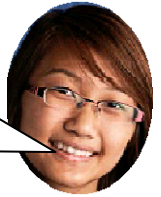$$\therefore -1g + 19200 - 19200 = 0 - 19200$$

$$\therefore -1g = -19200$$

$$\therefore g = 19200$$

There were 19200 gummi bears altogether.