Mth 111 Linear Models   *Franz Helfenstein*   **Name**
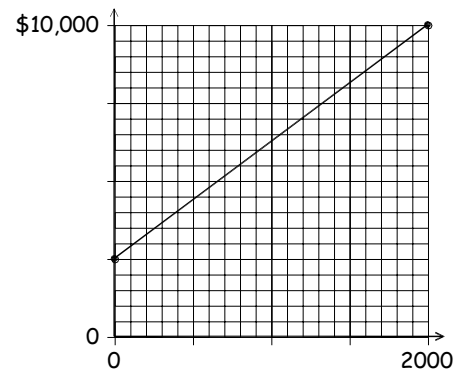
Answers must be clearly **legible**, **simplified** and **boxed** or **circled**. Unless otherwise stated write answer as an **exact** integer, fraction or use **two** decimal accuracy. **Units** required where appropriate.

Questions 1 – 10 refer to the following graph and data.
A company buys a machine to produce souvenirs. The plot shows their *production cost.* x = qty, y = dollars.

1)   What is the cost of the machine (fixed cost)?

2)   Once the machine is paid for, what does it cost to produce each item (variable cost)?

3)   Write the equation for the net <u>production cost</u> (including the machine). This is your <u>Cost</u> equation. Enter it in Y_1 to check.

4)   Suppose the items are sold for $15 each. What would the <u>revenue</u> equation be?

Use the following data and the <u>TI's linear regression</u> feature to answer the following questions.

5)   As price goes up, demand will drop. Considering Selling Price vs. # Sold, which should be the *dependent variable?*

Selling Price	$20	$22.50	$25
# Sold	1524	1248	1010

6)   Use the TI to find an equation for # Sold as a function of Selling Price. Write it here and save in Y_2.

7)   According to the regression equation, what selling price will generate 2000 souvenirs sold?

8)   According to the regression equation, what selling price will generate zero souvenirs sold?

9)   According to the regression equation, if the selling price is set to $15 how many will be sold?

10)   If the selling price is set to $15, using #9's result, what will be the company's <u>net</u> profit?