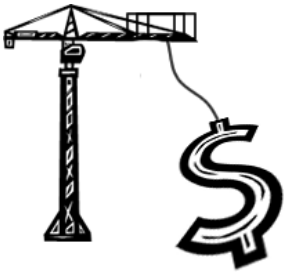


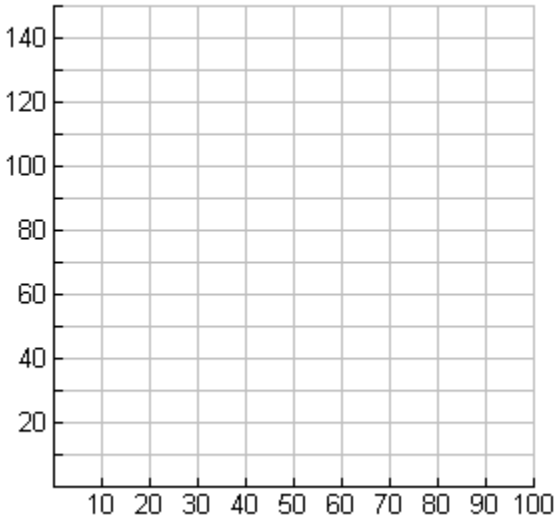
BUNGEE PROFITS

Jenna runs a bungee jumping company. She wants to make as much money as possible in her business. She collected some data to see what people might be willing to pay. The following table shows her data.

"How much would you be willing to pay to bungee jump?"						
price to jump ($)	5	15	25	30	50	75
# of people willing to jump	110	96	83	75	46	5

(data collected by randomly polling 150 people from the community)

1. Plot the data on the grid provided to the right.
   (Be sure to complete the graph with all important features.)



2. Draw in what you think is the best linear model (a straight line) for this data.

3. Write an equation for your line of best fit.

4. Using your model, answer the following:

   a. How many people would jump if it were free?

   b. What price is so high that nobody will jump?

   c. How many people would jump if each jump costs $20?

5. Jenna knows that the money she can collect (her income) will vary depending on how many people jump.

   a. If 110 people are willing to pay $5 to jump, what would her income be?

   b. Complete the table below to show Jenna's potential income.

price to jump ($)	5	15	25	30	50	75
# of people willing to jump	110	96	83	75	46	5
Income ($)	550					

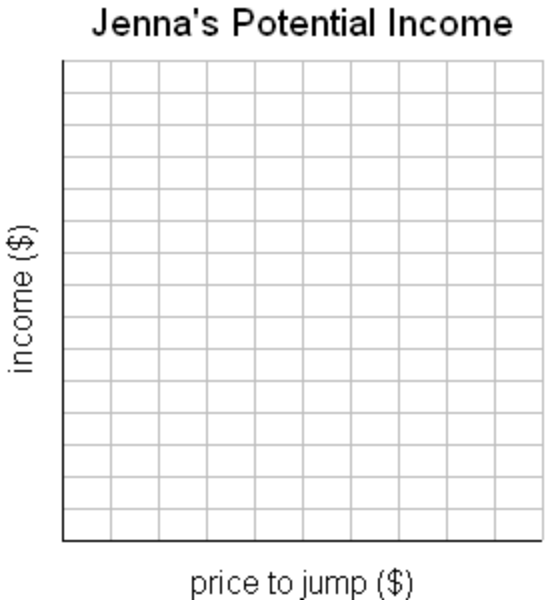
   c. Using your model from #2, complete this table showing a more detailed look at the relationship between *price to jump* and *income*.

price to jump ($)	0	10	20	30	40	50	60	70	80
Income ($)									

d. Plot the *price to jump* versus *income* data on the grid. (You should have at least 13 data points.)

e. Draw in what you think is a good model for the data points.

f. Describe the relationship between the variables *price to jump* and *income*.



6. Let's find an equation that fits your model.
   a. First our variables. Using what you have in your *Income* vs. *Price to Jump* graph, define the following.
      - Let x = _____
      - Let y = _____

   b. When you completed the table to show Jenna's potential income, you multiplied two things together.

price to jump ($)	5	15	25	30	50	75
# of people willing to jump	110	96	83	75	46	5
Income ($)	550	1440	2075	2250	2300	375

$25 \cdot 83 = 2075$

Fill in the blank: Every time you found that "*Income = price to jump* · _____ "

   c. Now for the rule. Fill in the missing parts below to find a rule for your model.

"*Income = price to jump* · _____ "

y = _____ · (_____)

Hint: Look back at your equation in #3 that you wrote to describe *# of people willing to jump*.

   d. Enter your rule in your calculator with an appropriate window and test to see if it works well as a model.
      - What would Jenna's income be if the *price to jump* is $15?
      - What would Jenna's income be if the *price to jump* is $45?
      - When would the income be $0?
      - When would Jenna get the income be the most?

7. Try to expand your rule to see the x^2 term of your quadratic model.

Factored Form $y = x(100 - x)$ **Expanded Form** $y = 100x - x^2$