

Investigating Quadratic Relations – Modelling a Business' Revenue

- a. A hockey arena seats 1600 people. The cost of a ticket is \$10. At this price, every ticket is sold. To increase revenue, the arena management plans to increase ticket prices. They conduct a survey and determine that for a 50 cent increase in price, 50 less people will attend
- i. What is the initial cost of a ticket?
 - ii. What is the initial number of people attending the game?
 - iii. What revenue/income does the hockey arena make?

 - iv. One price increment of \$0.50 is made. What is the new ticket price?
 - v. How many people attend the game now?
 - vi. What revenue/income does the hockey arena make?

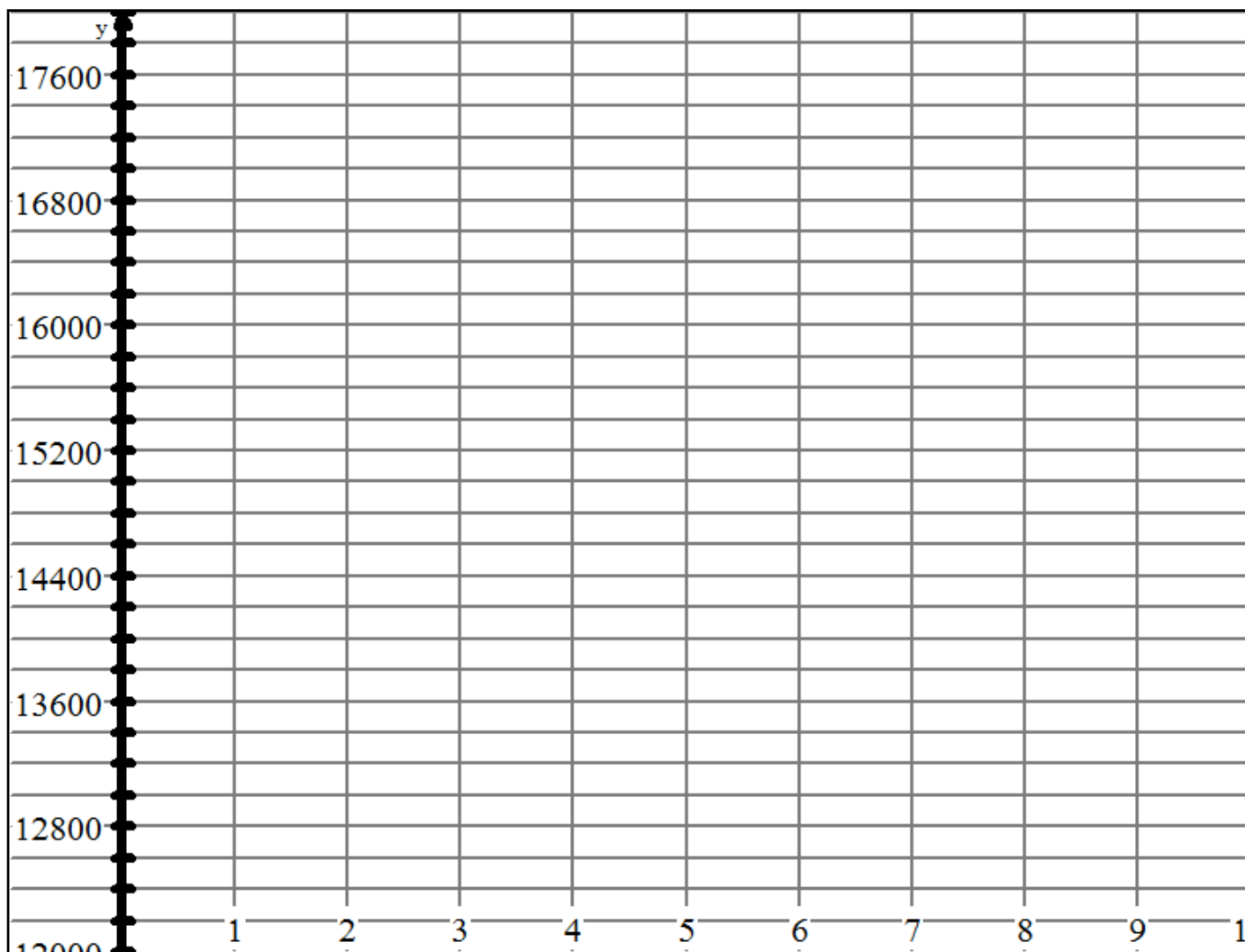
 - vii. Two price increments of \$0.50 are made. What is the new ticket price?
 - viii. How many people attend the game now?
 - ix. What revenue/income does the hockey arena make?

 - x. Three price increments of \$0.50 are made. What is the new ticket price?
 - xi. How many people attend the game now?
 - xii. What revenue/income does the hockey arena make?
- b. Continue this pattern to complete a data table

# of price increments	Ticket price	Number of people attending	Revenue/income
0	10	1,600	16,000
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

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- c. What type of a relation is “ticket price”? Write an equation for determining the ticket price.
- d. What type of a relation is “number of people attending”? Write an equation for determining the number of people attending.
- e. What type of relation is “revenue”? Write an equation for determining the revenue for the arena.
- f. Graph the data on the partial grid provided.



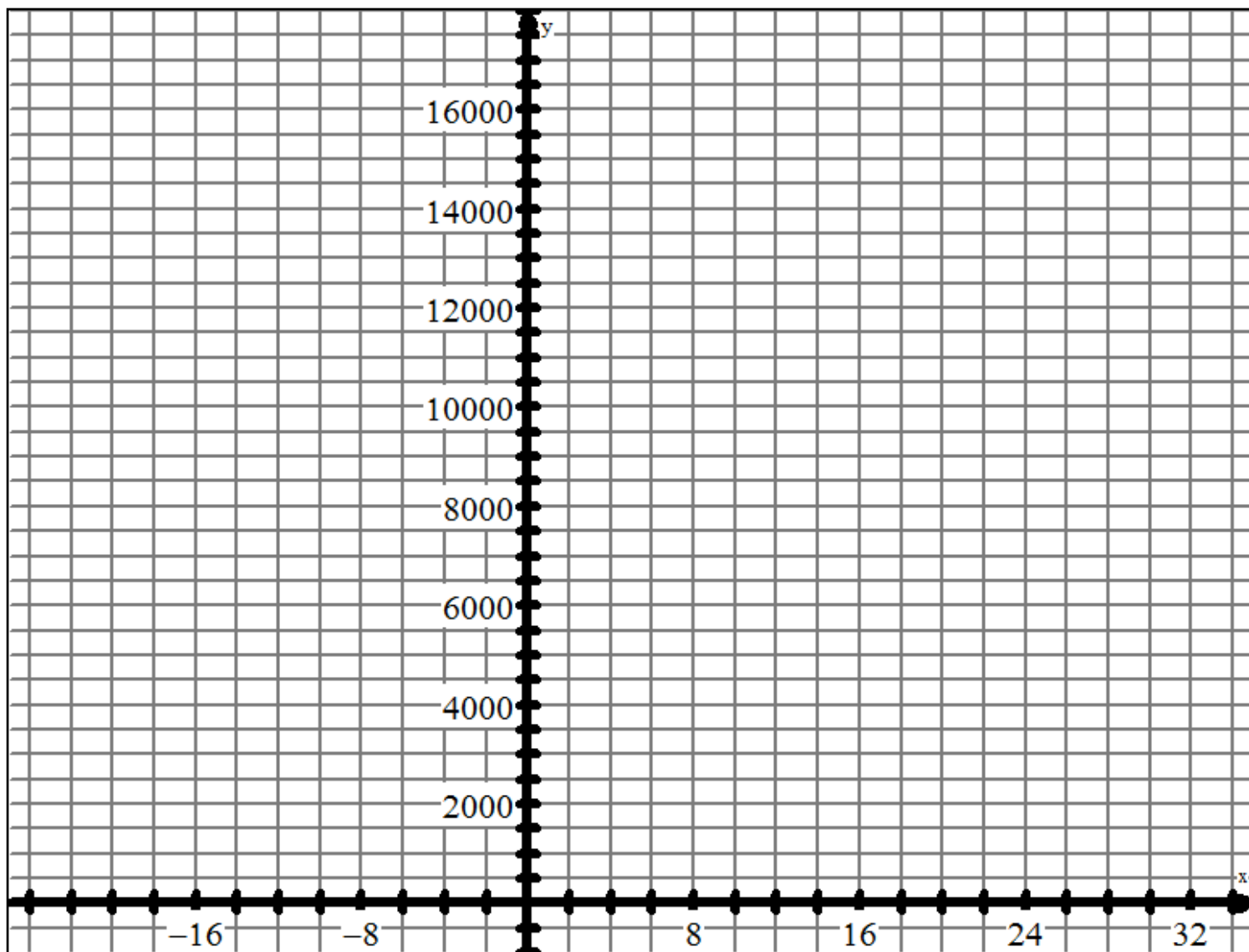
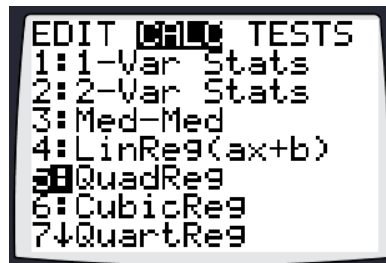
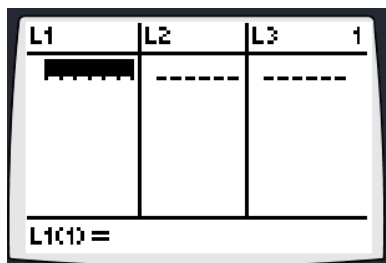
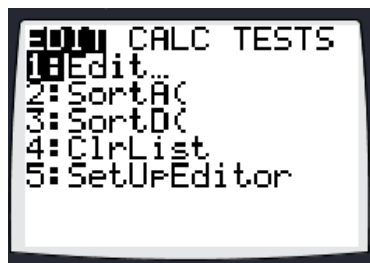
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- g. Now graph the complete relation from either (a) the equation or (b) from technology
 i. **Technology** – Let's look at the two data sets ($x \rightarrow$ # of price increments; $y \rightarrow$ revenue)

Go to STAT – EDIT to enter the data

Enter the x/y data in L1 and L2

STAT - CALC – 5 (QUADREG)



ANALYSIS QUESTIONS:

- h. Evaluate the revenue if $x = 15$.

- i. When will the revenues be \$16,500? When will it be \$13,300

- j. Determine the domain and range of this relation

- k. Determine and interpret the y-intercept of this relation.

- l. Determine the co-ordinates of the maximum point of this relation and interpret.

- m. Determine the zeroes/x-intercepts of this relation and interpret.

- n. Draw in the axis of symmetry of this relation. What IS an axis of symmetry?