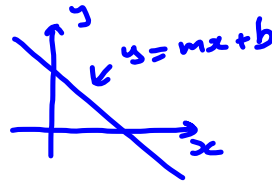


Trends in Graphs

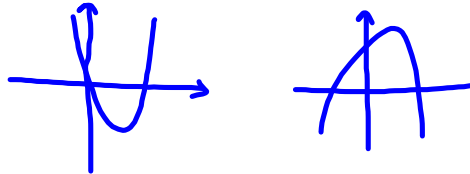
Recall:

The graph of a linear relation is a straight line.

$$y = mx + b$$

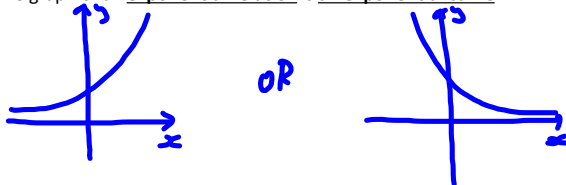


The graph of a quadratic relation is a parabola.



- Max/min value
- Do not always have x-intercepts
- There is always a y-intercept.

The graph of an exponential relation is an exponential curve.

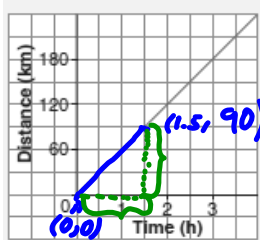


$$y = a b^x$$

- b - growth/decay factor
- x - time
- a - initial/starting value

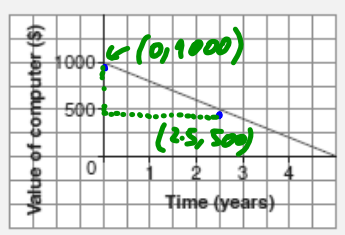
Example 1: Determine the slope of each line. What does each slope represent?

Distance Travelled by a Car



Slope =  $\frac{90-0}{1.5-0} = 60$   
 - slope represents speed  
 (speed =  $\frac{\text{distance}}{\text{time}}$ , km/h)

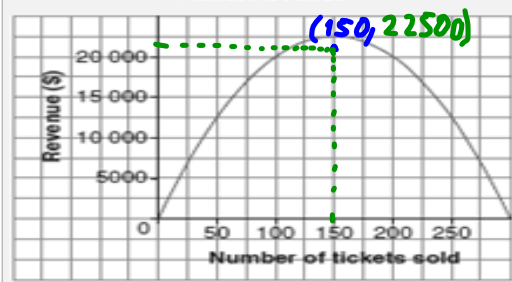
Depreciation of the Value of a Computer



slope =  $\frac{500}{-2.5} = -200$   
 - For every year, a computer depreciates by \$200.

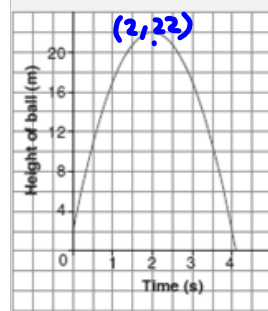
Example 2: Determine the coordinates of the vertex of each parabola. What do these coordinates represent in each situation?

Ticket Revenue



Vertex: (150, 22500)  
 Number of tickets sold in order to make the maximum amount of money  
 (150 tickets sold bring in the maximum revenue of \$22500.00)

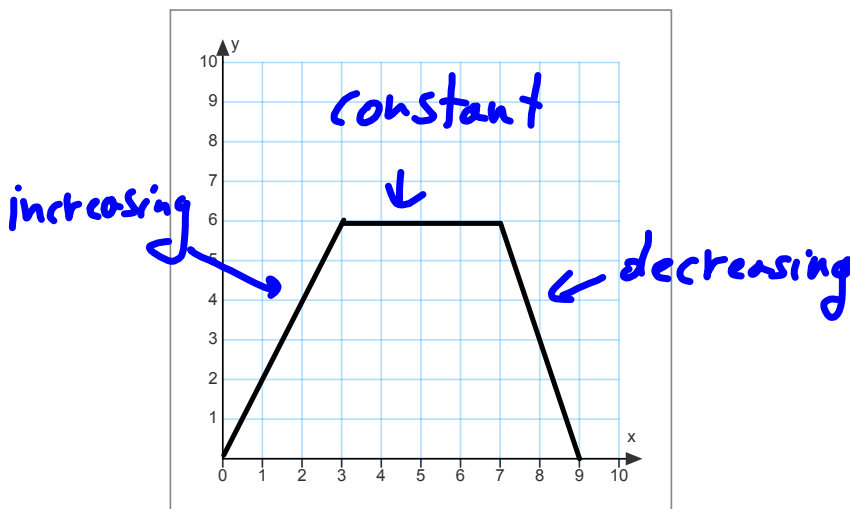
Height of Ball



Vertex: (2, 22)  
 The ball reaches its maximum height of 22 m after 2 s.

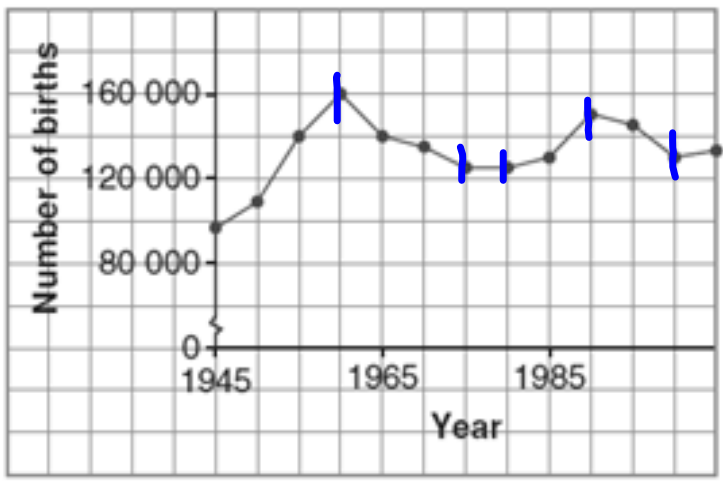
A graph is a visual representation of the relationship between two quantities. It shows how one quantity changes with respect to the other. **Trends occur in 3 broad groups:**

- a) **Increasing** – The graph will go up and to the right.
  - If it increases at a constant rate, the graph will be a straight line up to the right.
- b) **Decreasing** – The graph will go down to the right.
  - If it decreases at a constant rate, the graph will be a straight line down to the right.
- c) **Constant** – The graph goes straight across.
  - It is neither increasing nor decreasing.



Example 3: This graph shows the number of births in Ontario from 1945 to 2005. Describe the trends in the graph.

Ontario Births

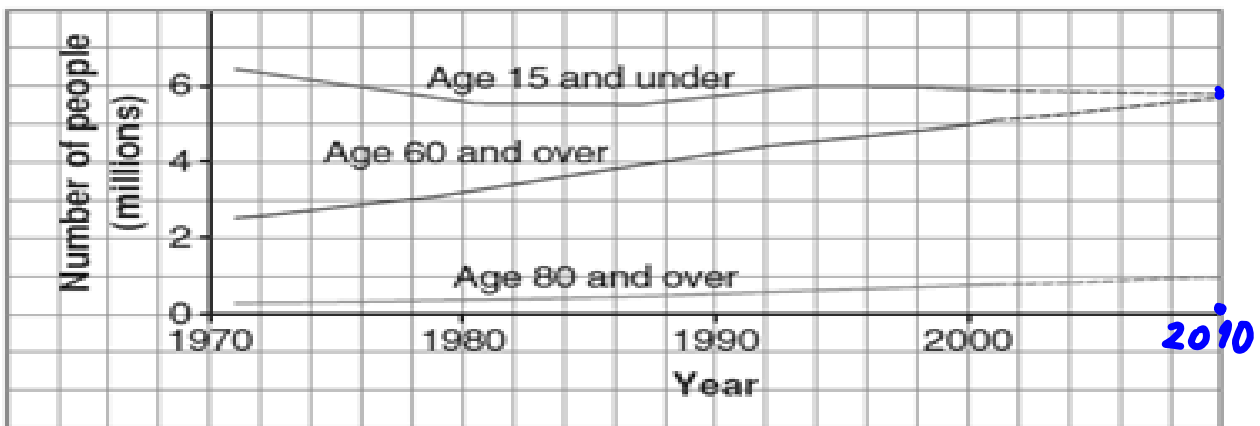


- \* 1945-1960 Ontario Births increased
- \* 1960-1975 Ontario Births decreased
- \* 1975-1980 Ontario Births were constant

- \* 1980-1990 Ontario Births increased
- \* 1990-2000 Ontario Births decreased
- \* 2000-2005 Ontario Births increased

- Example 4: a) Use the graph to predict the number of Canadians in each age group in 2010.  
b) What decisions might the Canadian government make in response to the trends in the graph?

**The Ageing of Canada's Population**



- a) 5.8 million Canadians age 15 and under  
5.8 million Canadians age 60 and over  
1 million Canadians age 80 and over
- b) The Canadian government might
- increase immigration rates
  - increase retirement age.
  - improve the health care so that people feel healthy (can work longer).

Homework: Pg. 273: #1-8,10-12