

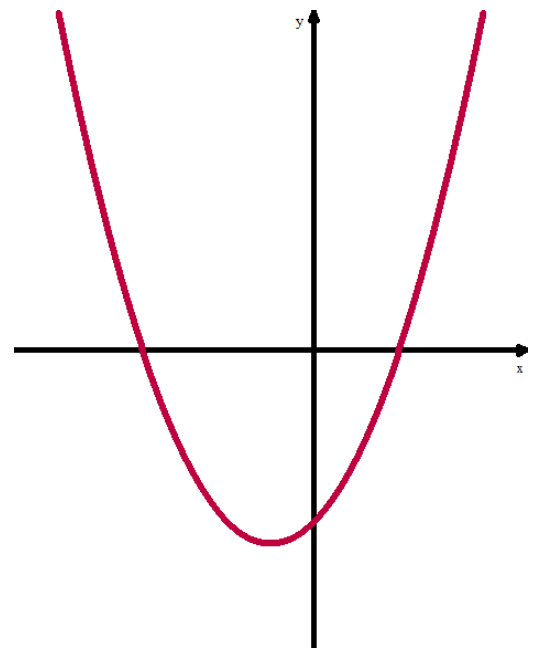
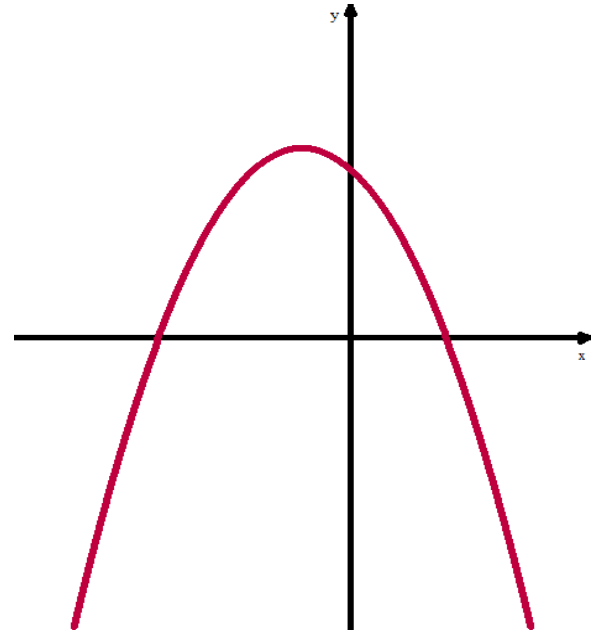
1) Lesson Objectives

- Review the key features of the graphs of quadratic relations
- Use a real world model to illustrate the meaning and relevance of the vertex, the zeroes, the y-intercept

2) CONCEPT REVIEW → Features of the Graphs of Quadratic Relations.

Define/describe/explain the following and label them on the diagram

- Direction of opening
- Vertex/optimum point/Max or Min point
- Optimal value/max or min value
- Zeroes/x-intercepts
- Y-intercept
- Axis of Symmetry
- Function concepts:
 - Evaluate $f(W)$
 - Solve $W = f(x)$
 - Evaluate $f^{-1}(W)$
 - Domain/Range
 - Graphing
 - Data tables



3) Modelling with Quadratic Relations

Ex 1 → Examine the graph of the quadratic relation below:

i) What are the co-ordinates of the vertex?

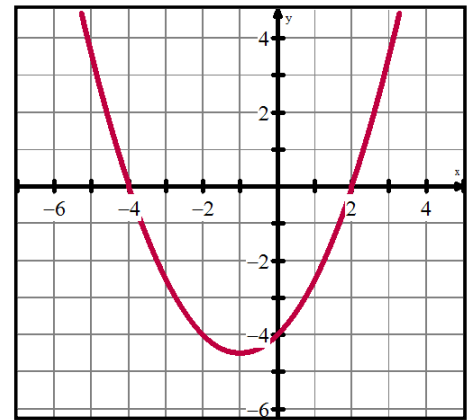
ii) What is the optimal value?

iii) What is the equation of the axis of symmetry?

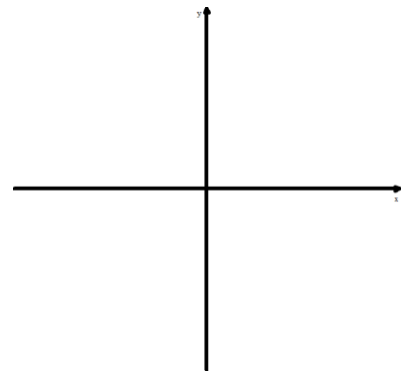
iv) What are the zeroes of the relation?

v) What would be the sign of the second differences?

vi) CHALLENGE: Determine the equation of this parabola.

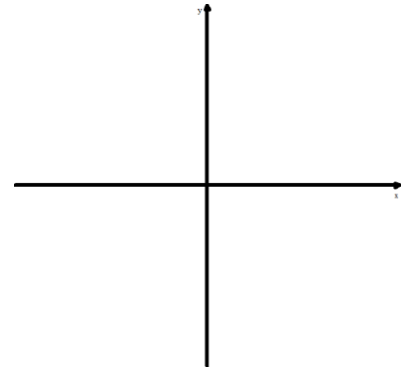


b) Ex 2 → Two parabolas each have zeroes of 1 and 11. One has a maximum value of 12, the other has a minimal value of -6. Sketch the 2 parabolas on the same axes.



c) CONNECTION TO ALGEBRA → A relation is defined by the equation $A(L) = 24L - L^2$. For this relation:

- i) Write the equation in factored form by removing the GCF.
- ii) Determine the zeros.
- iii) State the equation of the axis of symmetry.
- iv) Graph it on the GDC and determine the optimal value.
- v) Sketch the parabola, labeling the key features



d) A soccer ball is kicked up into the air. The height of the soccer ball above the ground is approximated by the equation $h(t) = 30t - 5t^2$, where h is height in meters and t is time in seconds.

- i) What are the zeroes of the relation? What do they MEAN in the context of the problem?
- ii) What are the co-ordinates of the vertex? What does it MEAN in the context of the problem?
- iii) What is the height of the ball after 2 seconds?
- iv) When does the ball reach a height of 40 m?
- v) Use this information above to sketch the parabola, labeling the key features.
- vi) Explain the connection between the features of the graph and the equation

4) Homework:

From the Nelson 10 Textbook, Sec 3.2, p267, Q3-6,12,14 are CONCEPTUAL and Q7bef, 9ac, 11,13,15 are ALGEBRAIC in nature