

INTERNAL ASSESSMENT HL TYPE I

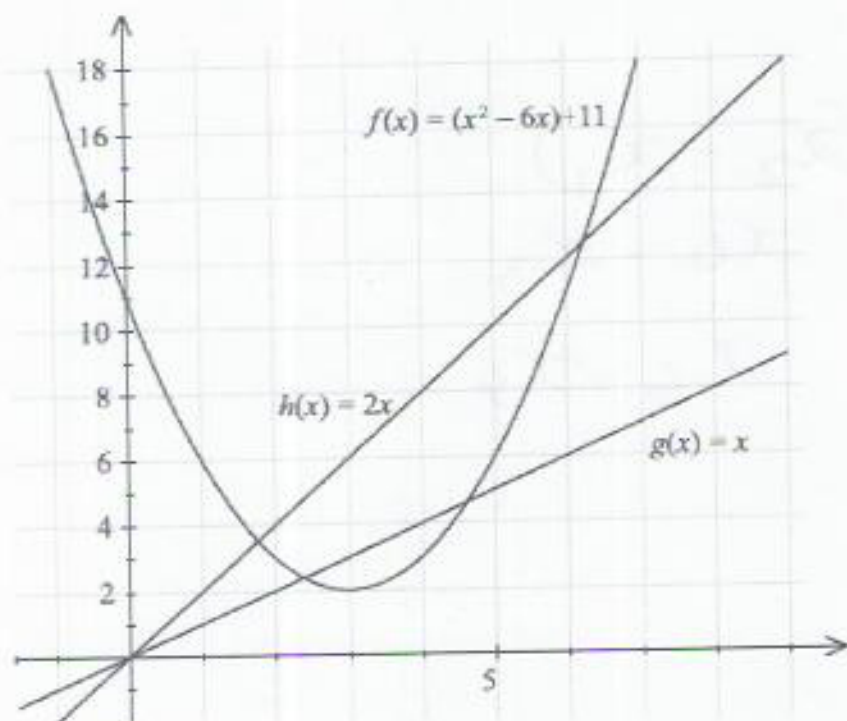
PARABOLA INVESTIGATION

Description

In this task, you will investigate the patterns in the intersections of parabolas and the lines $y = x$ and $y = 2x$. Then you will be asked to prove your conjectures and to broaden the scope of the investigation to include other lines and other types of polynomials.

Method

1. Consider the parabola $y = (x - 3)^2 + 2 = x^2 - 6x + 11$
and lines $y = x$ and $y = 2x$
 - Using technology, find the four intersections illustrated on the diagram below:



- Label the x-values of these intersections as they appear from left to right on the x-axis as x_1, x_2, x_3 and x_4 .
- Find the values of $x_2 - x_1$ and $x_4 - x_3$, and name them S_L and S_R .
- Finally, calculate $D = |S_L - S_R|$.

