MATHEMATICS
Level One

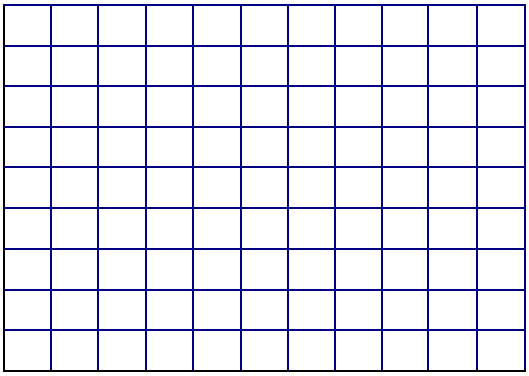
"Vectors"

Setting: Harry has been hired to survey a property in Hamilton. He has obtained coordinates for the property and wants to have an idea of what the corners of the property look like on paper, before leaving the office.

Task A

1) a) Draw a suitable set of axes for Easting (x) and Northing (y)
   b) Plot and label the following coordinates on the grid provided

Easting (x) In metres	Northing (y) In metres
1	1
1	5
5	1
5	5



2) What is the shape of the property?
3) Calculate the area of the property
4) If the scale factor of the diagram is the length of 1 square, which equals 20m, calculate the area in m^2 of the property.
5) The property is being surveyed, so that it can be subdivided into two smaller sections of equal size and shape. What will be the finished dimensions and area of the lots? (Extension – how many ways can you find to do this if only the area needs to be the same? Which options are unlikely to be acceptable? Why not?)

Task B

Setting: The next-door neighbour heard about Harry subdividing the lots (Task A) and thinks he might do the same. Harry has to survey and subdivide the land. He ends up with final coordinates for the corners of the second property as shown in the table.

Easting (x in metres)	Northing (y in metres)
5	1
5	5
9	4
9	1

1) Plot the above points on a new graph, remembering to label the axes.
2) What shape have you drawn?
3) What is the area of the property? (No scale applied).
4) For subdividing this property into two sections where would you suggest that the new boundary be placed so both section have equal area?
5) What shapes are the lots now?
6) The scale of each square represents 20m, calculate the area in m^2.
7) If he was going to sell the lots at \$3000 per acre (4047m^2 per acre) what would the price of lots be per square metre?