

MATHEMATICS

Level One

“Lake Reserve”

Task One

Background: In Cadastral surveying, traversing is a method used to fix the location of property boundaries. Traversing involves the measurement of both distance and direction and enables you to calculate **(X, Y) coordinates** – surveyors often call these **Eastings and Northings**. When you traverse, you start at a point with a known coordinate and then move from one point to the next, measuring the distance and the direction between them. This enables you to define the land that you own.

Setting: Max has to survey around a lake to define the land that is going to be given to a new owner. He has a starting coordinate of 257000mE, 348575mN. He made the following measurements in traversing around the lake.

a) 040° for 232m b) 325° for 125m *Note that all angles are from North (0°) in a clockwise direction*
 c) 276° for 182m d) 238° for 236m
 e) 180° for 200m

- 1) Plot the above traverse on the graph below: This will involve working out the scale of the graph and using direction and distance to plot the points. Hint how many metres per square?
- 2) Calculate the coordinates of each point on the traverse. (To make this easier, you may wish to sketch a right angled triangle between each point and use the SOHCAHTOA rule).

Point	Bearing	Distance (m)	ΔE	ΔN	Easting	Northing
Start			---	---	257000	348575
To a	040°	232				
To b	325°	125				
To c	276°	182				
To d	238°	236				
To e	180°	200				

- 3) Calculate the bearing and distance of the line which will take you from the last point back to the starting peg. (This is called closing the traverse).
- 4) Calculate the distance of the traverse from the start to finish.
- 5) What is the total area of land between the traverse and the lake edge? (In m² and hectares).
- 6) What is the total area of the lake in m² and in hectares?

Map of Lake

