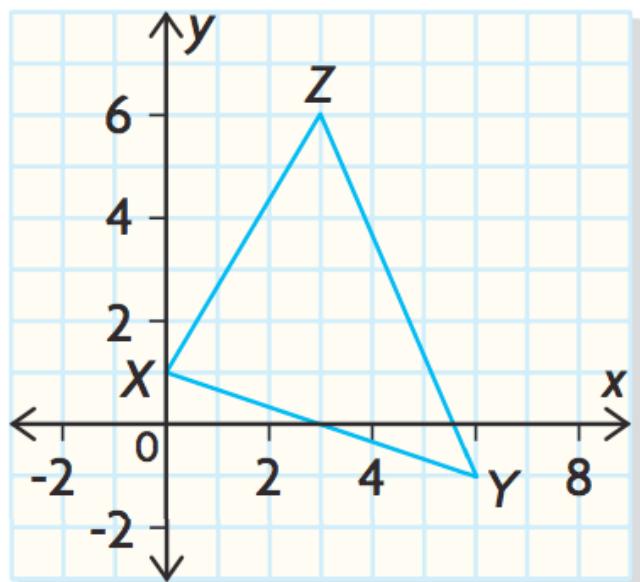


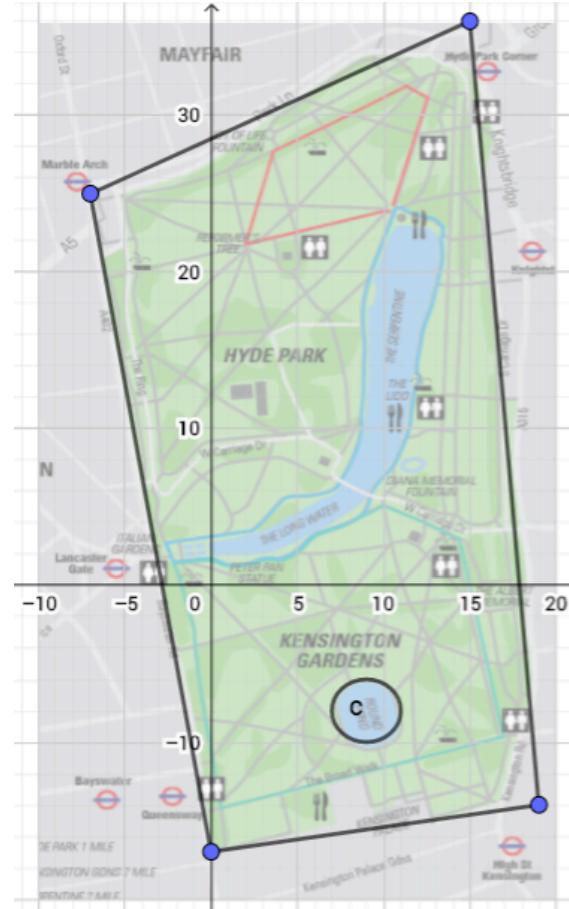
This entire Assessment is CALCULATOR ACTIVE

Do NOT write solutions on this page. Answer all questions on the answer sheets provided.

1. The vertices of ΔLMN are at $L(0,4)$, $M(-5,2)$ and $N(2,-2)$. A perpendicular bisector of side MN is to be drawn. **(total 10 points)**
 - a. What is a perpendicular bisector in the first place? [2]
 - b. Determine the **equation** of the **perpendicular bisector** that passes through MN . [8]
2. The quadrilateral JKLM has vertices at $J(-1,1)$, $K(3,4)$, $L(8,4)$ and $M(4,1)$. You are being asked to determine what type of quadrilateral JKLM is. **(total 11 points)**
 - a. Outline your KEYS steps that you plan on carrying out. [3]
 - b. Carry out your planned steps and determine the quadrilateral type for JKLM. [8]
3. The vertices of ΔXYZ are at $X(0,1)$, $Y(6,-1)$ and $Z(3,6)$. You are required to use analytical geometry to determine the coordinates of the centroid (the point in the “middle” of the triangle where medians intersect). **(total 11 points)**
 - a. What is a median of a triangle? [1]
 - b. Using the diagram included, draw any two medians. [2]
 - c. Determine the equations of both of your medians. [6]
 - d. Use the equations of the medians to find the co-ordinates of the centroid. [2]



4. Here is a map showing Hyde Park and Kensington Gardens in London. To help “analyze” the park using geometry, Mr S has used geogebra to help with the analysis:



He has used the “corner points” of $A(0, -17)$, $B(-7, 25)$, $C(15, 36)$ and $D(19, -14)$. The scaling factor in this diagram is 1 unit : 50 meters. **(total 17 marks)**

- Mr S decides he would like to run the perimeter of the park. How far does he run? [4]
- The Lancaster Gate tube station is located at the midpoint of side AB. Find the coordinates of the Lancaster Gate tube station. [2]
- In Kensington Gardens, you will see Round Pond. It's center is located at the co-ordinate $(9, -8)$ and the diameter of Round Pond is approximately 200 m. Determine the equation used to model Round Pond (see the circle labelled c on the geogebra diagram.) [4]
- Side AB is actually on the Bayswater Road. How far is the center of Round Pond from Bayswater Road? [7]

5. GEOGEBRA ACTIVE Question:

Here is a theorem about circles and tangents ➔ A line that is tangent to a circle forms a right angle with the circle's radius, at the point of contact of the tangent (tangency point).

Tangent definition: A tangent to a circle is a straight line that touches the circle at only one point (so it does not cross the circle - it just touches it).

So, you will use GEOGEBRA to show that a line tangent to a circle is always perpendicular to the radius at the tangency point. **(total 6 marks)**

- a. From GEOGEBRA, write the KEY STEPS of your procedure that you did to help DEMONSTRATE that this theorem is valid. [3]

- b. Finally, record the relevant information that shows that this theorem is valid. [3]