IYGB GCE

Core Mathematics C1

Advanced Subsidiary

Practice Paper L

Difficulty Rating: 3.2000/1.4286

Time: 1 hour 30 minutes

Calculators may NOT be used in this examination.

Information for Candidates

This practice paper follows the Edexcel Syllabus.
The standard booklet "Mathematical Formulae and Statistical Tables" may be used.
Full marks may be obtained for answers to ALL questions.
The marks for the parts of questions are shown in round brackets, e.g. **(2)**.
There are 10 questions in this question paper.
The total mark for this paper is 75.

Advice to Candidates

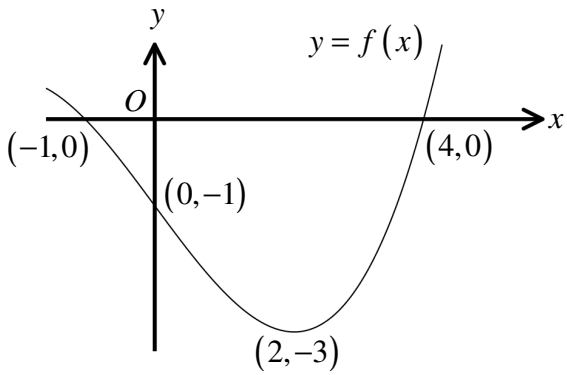
You must ensure that your answers to parts of questions are clearly labelled.
You must show sufficient working to make your methods clear to the Examiner.
Answers without working may not gain full credit.
The examiner may refuse to mark any parts of questions if deemed not to be legible.

Question 1

The figure below shows the graph of the curve with equation $y = f(x)$.

The curve meets the x axis at the points with coordinates $(-1,0)$ and $(3,0)$, and the y axis at the point with coordinates $(0,-1)$.

The curve has a minimum at $(2,-3)$.



Sketch on separate diagrams the graph of …

a) … $y = f(x+2)$. **(3)**

b) … $y = f\left(\frac{1}{2}x\right)$. **(2)**

Each sketch must include the coordinates of any points where the graph meets the coordinate axes and the new coordinates of the minimum point of the curve.

Question 2

$$\frac{1+\sqrt{7}}{3-\sqrt{7}} - \frac{8-\sqrt{7}}{\sqrt{7}-2}.$$

Show clearly that the above surd expression simplifies to a positive integer, stating its value. **(5)**

Question 3

a) Solve the linear inequality

$$4(2x+3)+x>47-5x. \qquad (2)$$

b) Solve the quadratic inequality

$$(5-x)(2x+1)\leq 0. \qquad (3)$$

c) Hence determine the range of values of x that satisfy both the inequalities of part (a) and part (b). **(1)**

Question 4

Evaluate the following sum, showing clearly all the steps in the calculation

$$\sum_{r=1}^{50}(180-7r). \qquad (4)$$

Question 5

The straight line L and the curve C have respective equations

$$L:\ 2y=7x+10,$$

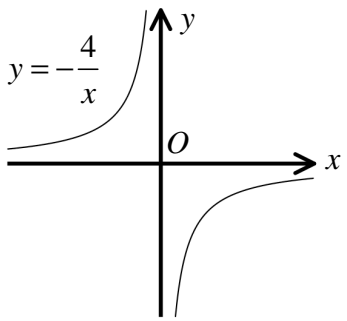
$$C:\ y=x(6-x).$$

a) Show that L and C do **not** intersect. **(4)**

b) Find the coordinates of the maximum point of C. **(2)**

c) Sketch on the same diagram the graph of L and the graph of C, showing clearly the coordinates of any points where each of the graphs meet the coordinate axes. **(4)**

Question 6



The figure above shows the graph of the curve with equation

$$y = -\frac{4}{x},\ x \neq 0.$$

a) Sketch the graph of the curve C with equation

$$y = 2 - \frac{4}{x},\ x \neq 0.$$

Indicate clearly the coordinates of any points of intersection between C and the coordinate axes. **(3)**

b) State the equations of the two asymptotes of C. **(2)**

Question 7

The point $P(8,18)$ lies on the curve C, whose gradient function is given by

$$\frac{dy}{dx} = 8\sqrt[3]{x} - 10,\ x \geq 0.$$

Find an equation for C. **(6)**

Question 8

The first three terms of an arithmetic series are

$$-p, \quad (2p-5) \quad \text{and} \quad (3p-2) \quad \text{respectively,}$$

where p is a constant.

a) Show clearly that $p = 4$. **(4)**

b) Find the sum of the first twenty terms of the series. **(3)**

The k^{th} term of the series is over 1000.

c) Determine the smallest value of k. **(3)**

Question 9

The straight line l_1 passes through the points $A(0,3)$ and $B(12,9)$.

a) Find an equation for l_1. **(3)**

The straight line l_2 passes through the point $C(11,1)$ and is perpendicular to l_1.

The two lines intersect at the point P.

b) Calculate the coordinates of P. **(5)**

c) Determine the length of CP. **(2)**

d) Hence, or otherwise, show that the area of the triangle APC is 30 square units. **(3)**

Question 10

A curve C and a straight line L have respective equations

$$y = 2x^2 - 6x + 5 \quad \text{and} \quad 2y + x = 4 .$$

a) Find the coordinates of the points of intersection between C and L. **(5)**

b) Show that L is a normal to C. **(4)**

The tangent to C at the point P is parallel to L.

c) Determine the x coordinate of P. **(2)**