

Edexcel GCE
Core Mathematics C2
Silver Level S3
(Question Paper)

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Paper Reference(s)

6664/01

**Edexcel GCE
Core Mathematics C2
Silver Level S3**

Time: 1 hour 30 minutes

Materials required for examination papers

Mathematical Formulae (Green)

Items included with question

Nil

Candidates may use any calculator allowed by the regulations of the Joint Council for Qualifications. Calculators must not have the facility for symbolic algebra manipulation, differentiation and integration, or have retrievable mathematical formulas stored in them.

Instructions to Candidates

Write the name of the examining body (Edexcel), your centre number, candidate number, the unit title (Core Mathematics C2), the paper reference (6664), your surname, initials and signature.

Information for Candidates

A booklet 'Mathematical Formulae and Statistical Tables' is provided.

Full marks may be obtained for answers to ALL questions.

There are 11 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 gain no credit.

Suggested grade boundaries for this paper:

A*	A	B	C	D	E
70	63	56	48	41	34

1. $f(x) = 2x^3 - 7x^2 - 5x + 4$

(a) Find the remainder when $f(x)$ is divided by $(x - 1)$. (2)

(b) Use the factor theorem to show that $(x + 1)$ is a factor of $f(x)$. (2)

(c) Factorise $f(x)$ completely. (4)

May 2011

2. In the triangle ABC , $AB = 11$ cm, $BC = 7$ cm and $CA = 8$ cm.

(a) Find the size of angle C , giving your answer in radians to 3 significant figures. (3)

(b) Find the area of triangle ABC , giving your answer in cm^2 to 3 significant figures. (3)

January 2011

3. (a) Find the first 4 terms, in ascending powers of x , of the binomial expansion of $(1 + ax)^{10}$, where a is a non-zero constant. Give each term in its simplest form. (4)

Given that, in this expansion, the coefficient of x^3 is double the coefficient of x^2 ,

(b) find the value of a . (2)

June 2008

4.

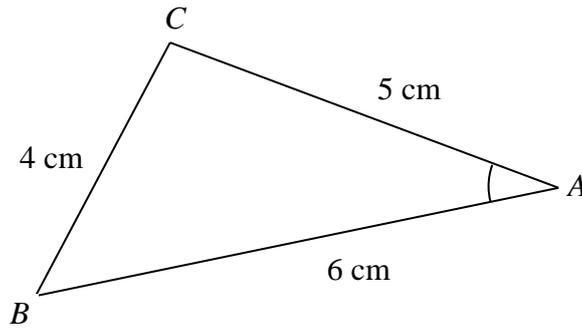


Figure 1

Figure 1 shows the triangle ABC , with $AB = 6$ cm, $BC = 4$ cm and $CA = 5$ cm.

(a) Show that $\cos A = \frac{3}{4}$. (3)

(b) Hence, or otherwise, find the exact value of $\sin A$. (2)

May 2007

5. The first three terms of a geometric series are $4p$, $(3p + 15)$ and $(5p + 20)$ respectively, where p is a **positive** constant.

(a) Show that $11p^2 - 10p - 225 = 0$. (4)

(b) Hence show that $p = 5$. (2)

(c) Find the common ratio of this series. (2)

(d) Find the sum of the first ten terms of the series, giving your answer to the nearest integer. (3)

May 2013 (R)

6.

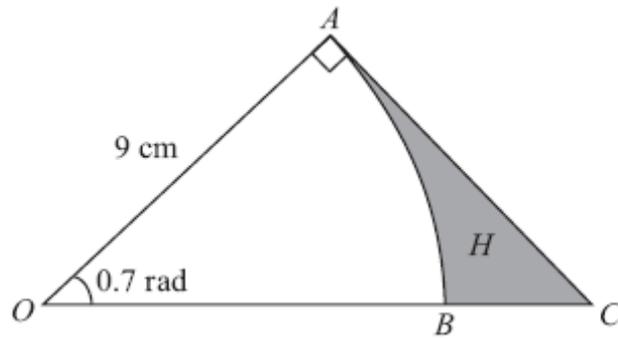


Figure 2

Figure 2 shows the sector OAB of a circle with centre O , radius 9 cm and angle 0.7 radians.

(a) Find the length of the arc AB . (2)

(b) Find the area of the sector OAB . (2)

The line AC shown in Figure 2 is perpendicular to OA , and OBC is a straight line.

(c) Find the length of AC , giving your answer to 2 decimal places. (2)

The region H is bounded by the arc AB and the lines AC and CB .

(d) Find the area of H , giving your answer to 2 decimal places. (3)

June 2010

7.

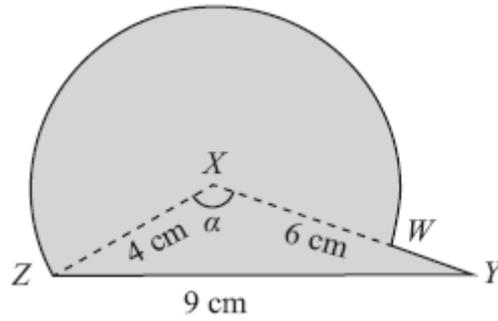


Figure 3

The triangle XYZ in Figure 3 has $XY = 6$ cm, $YZ = 9$ cm, $ZX = 4$ cm and angle $ZXY = \alpha$. The point W lies on the line XY .

The circular arc ZW , in Figure 3 is a major arc of the circle with centre X and radius 4 cm.

(a) Show that, to 3 significant figures, $\alpha = 2.22$ radians. (2)

(b) Find the area, in cm^2 , of the major sector $XZWX$. (3)

The region enclosed by the major arc ZW of the circle and the lines WY and YZ is shown shaded in Figure 3.

Calculate

(c) the area of this shaded region, (3)

(d) the perimeter $ZWYZ$ of this shaded region. (4)

January 2013

8. A trading company made a profit of £50 000 in 2006 (Year 1).

A model for future trading predicts that profits will increase year by year in a geometric sequence with common ratio r , $r > 1$.

The model therefore predicts that in 2007 (Year 2) a profit of £50 000 r will be made.

- (a) Write down an expression for the predicted profit in Year n . (1)

The model predicts that in Year n , the profit made will exceed £200 000.

- (b) Show that $n > \frac{\log 4}{\log r} + 1$. (3)

Using the model with $r = 1.09$,

- (c) find the year in which the profit made will first exceed £200 000, (2)
- (d) find the total of the profits that will be made by the company over the 10 years from 2006 to 2015 inclusive, giving your answer to the nearest £10 000. (3)

May 2007

9. The curve with equation

$$y = x^2 - 32\sqrt{x} + 20, \quad x > 0,$$

has a stationary point P .

Use calculus

- (a) to find the coordinates of P , (6)
- (b) to determine the nature of the stationary point P . (3)

May 2013

TOTAL FOR PAPER: 75 MARKS

END