

**Edexcel GCE**  
**Core Mathematics C2**  
**Silver Level S1**  
**(Question Paper)**

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Paper Reference(s)

**6664/01**

**Edexcel GCE  
Core Mathematics C2  
Silver Level S1**

**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**

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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**

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

Full marks may be obtained for answers to ALL questions.

There are 10 questions in this question paper. The total mark for this paper is 75.

**Advice to Candidates**

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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:**

<b>A*</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>70</b>	<b>63</b>	<b>56</b>	<b>50</b>	<b>43</b>	<b>36</b>

1. Find the first 3 terms, in ascending powers of  $x$ , of the binomial expansion of

$$(3 - x)^6$$

and simplify each term.

(4)

January 2010

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2. (a) Use the binomial theorem to find all the terms of the expansion of

$$(2 + 3x)^4.$$

Give each term in its simplest form.

(4)

- (b) Write down the expansion of

$$(2 - 3x)^4$$

in ascending powers of  $x$ , giving each term in its simplest form.

(1)

May 2013

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3.  $f(x) = 2x^3 + ax^2 + bx - 6,$

where  $a$  and  $b$  are constants.

When  $f(x)$  is divided by  $(2x - 1)$  the remainder is  $-5$ .

When  $f(x)$  is divided by  $(x + 2)$  there is no remainder.

- (a) Find the value of  $a$  and the value of  $b$ .

(6)

- (b) Factorise  $f(x)$  completely.

(3)

January 2010

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4. Solve, for  $0 \leq x < 180^\circ,$

$$\cos(3x - 10^\circ) = -0.4,$$

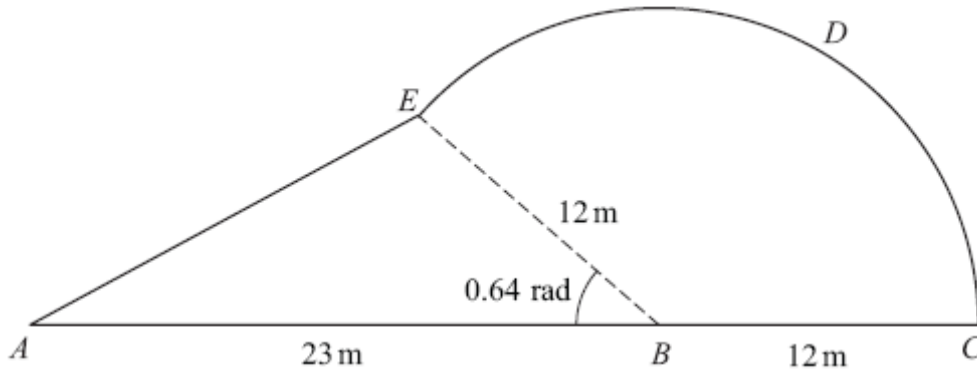
giving your answers to 1 decimal place. You should show each step in your working.

(7)

January 2013

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5.



**Figure 1**

Figure 1 shows a plan view of a garden.

The plan of the garden  $ABCDEA$  consists of a triangle  $ABE$  joined to a sector  $BCDE$  of a circle with radius  $12\text{ m}$  and centre  $B$ .

The points  $A$ ,  $B$  and  $C$  lie on a straight line with  $AB = 23\text{ m}$  and  $BC = 12\text{ m}$ .

Given that the size of angle  $ABE$  is exactly  $0.64$  radians, find

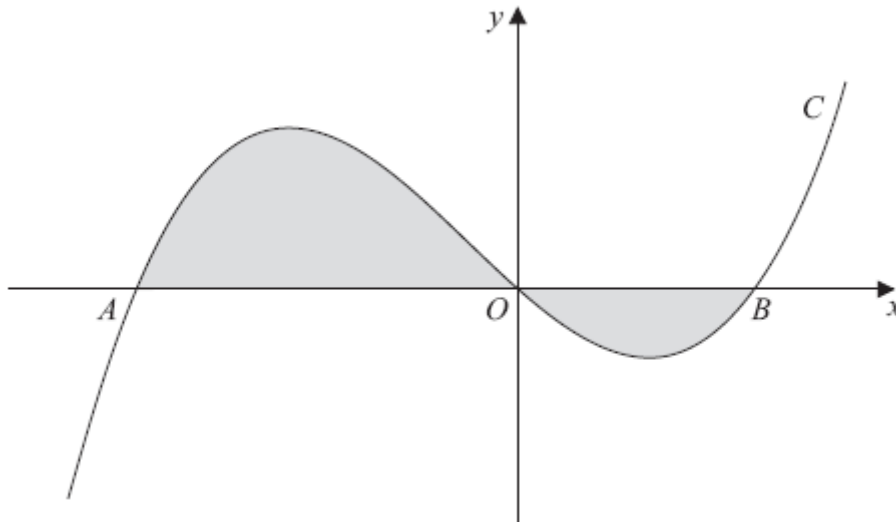
(a) the area of the garden, giving your answer in  $\text{m}^2$ , to 1 decimal place, (4)

(b) the perimeter of the garden, giving your answer in metres, to 1 decimal place. (5)

**May 2013**

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6.



**Figure 2**

Figure 2 shows a sketch of part of the curve  $C$  with equation

$$y = x(x + 4)(x - 2).$$

The curve  $C$  crosses the  $x$ -axis at the origin  $O$  and at the points  $A$  and  $B$ .

(a) Write down the  $x$ -coordinates of the points  $A$  and  $B$ .

**(1)**

The finite region, shown shaded in Figure 3, is bounded by the curve  $C$  and the  $x$ -axis.

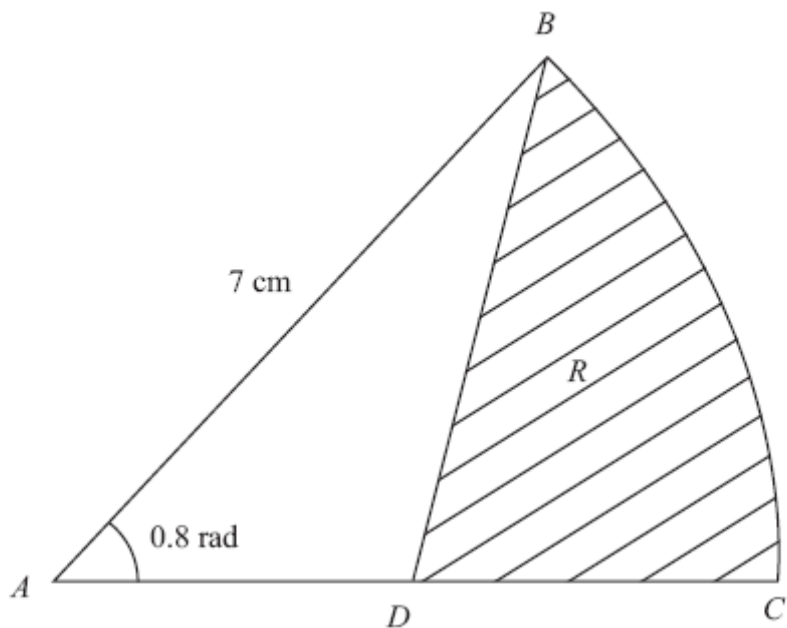
(b) Use integration to find the total area of the finite region shown shaded in Figure 2.

**(7)**

**May 2013**

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7.



**Figure 3**

Figure 3 shows  $ABC$ , a sector of a circle with centre  $A$  and radius 7 cm.

Given that the size of  $\angle BAC$  is exactly 0.8 radians, find

(a) the length of the arc  $BC$ , (2)

(b) the area of the sector  $ABC$ . (2)

The point  $D$  is the mid-point of  $AC$ . The region  $R$ , shown shaded in Figure 3, is bounded by  $CD$ ,  $DB$  and the arc  $BC$ .

Find

(c) the perimeter of  $R$ , giving your answer to 3 significant figures, (4)

(d) the area of  $R$ , giving your answer to 3 significant figures. (4)

**June 2008**

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8. A circle  $C$  has centre  $M(6, 4)$  and radius 3.

(a) Write down the equation of the circle in the form

$$(x - a)^2 + (y - b)^2 = r^2. \quad (2)$$

**Figure 4**

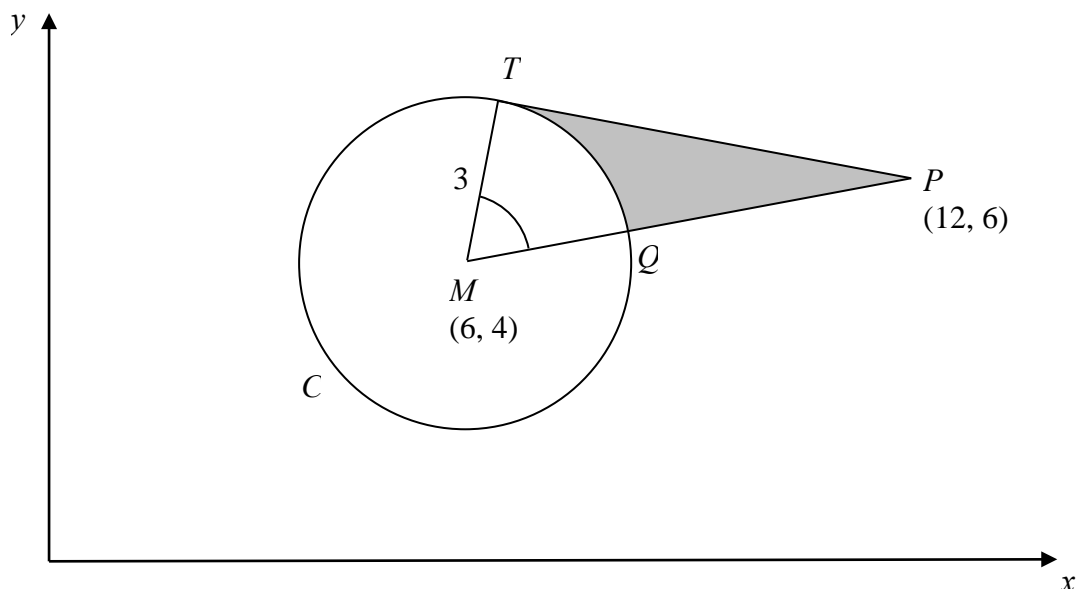


Figure 4 shows the circle  $C$ . The point  $T$  lies on the circle and the tangent at  $T$  passes through the point  $P(12, 6)$ . The line  $MP$  cuts the circle at  $Q$ .

- (b) Show that the angle  $TMQ$  is 1.0766 radians to 4 decimal places. (4)

The shaded region  $TPQ$  is bounded by the straight lines  $TP$ ,  $QP$  and the arc  $TQ$ , as shown in Figure 4.

- (c) Find the area of the shaded region  $TPQ$ . Give your answer to 3 decimal places. (5)

**January 2008**

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9. The curve  $C$  has equation  $y = 12\sqrt{(x) - x^{\frac{3}{2}} - 10}$ ,  $x > 0$ .

(a) Use calculus to find the coordinates of the turning point on  $C$ . (7)

(b) Find  $\frac{d^2y}{dx^2}$ . (2)

(c) State the nature of the turning point. (1)

**January 2010**

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**TOTAL FOR PAPER: 75 MARKS**

**END**