PhysicsAndMathsTutor.com

Paper Reference (complete below)	Centre No.					
6663/01	Candidate No.					

Surname	Initial(s)
Signature	

Paper Reference(s)

6663

Edexcel GCE

Core Mathematics C2

Advanced Subsidiary

Set A: Practice Paper 6

Time: 1 hour 30 minutes

Examiner's use only

Team Leader's use only

Question Number	Leave Blank
1	
2	
3	
4	
5	
6	
7	
Total	

Materials required for examination
Mathematical Formulae

Items included with question papers
Nil

Candidates may use any calculator EXCEPT those with the facility for symbolic algebra, differentiation and/or integration. Thus candidates may NOT use calculators such as the Texas Instruments TI-89, TI-92, Casio *cfx* 9970G, Hewlett Packard HP 48G.

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature. You must write your answer for each question in the space following the question. If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

A booklet 'Mathematical Formulae and Statistical Tables' is provided.
Full marks may be obtained for answers to ALL questions.
This paper has nine questions.

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.

Turn over

Edexcel
Success through qualifications

1. A circle C has equation

$$x^2 + y^2 - 10x + 6y - 15 = 0.$$

(a) Find the coordinates of the centre of C. **(2 marks)**

(b) Find the radius of C. **(2 marks)**

---

2. Express $\dfrac{y+3}{(y+1)(y+2)} - \dfrac{y+1}{(y+2)(y+3)}$ as a single fraction in its simplest form.

(5 marks)

---

3. Given that $2 \sin 2\theta = \cos 2\theta$,

(a) show that $\tan 2\theta = 0.5$. **(1 marks)**

(b) Hence find the values of θ, to one decimal place, in the interval $0 \leq \theta < 360$ for which $2 \sin 2\theta° = \cos 2\theta°$. **(5 marks)**

---

4. $f(x) = x^3 - x^2 - 7x + c$, where c is a constant.

Given that $f(4) = 0$,

(a) find the value of c, **(2 marks)**

(b) factorise $f(x)$ as the product of a linear factor and a quadratic factor. **(3 marks)**

(c Hence show that, apart from $x = 4$, there are no real values of x for which $f(x) = 0$. **(2 marks)**

---

5. **Figure 1**

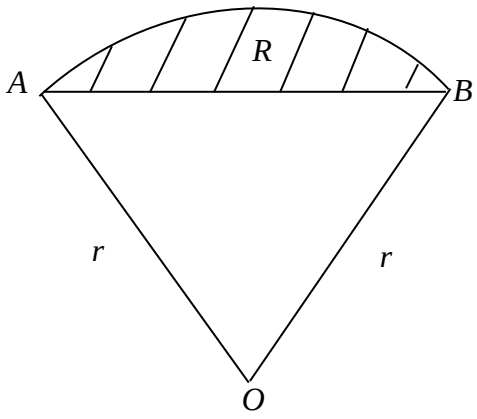

Figure 1 shows the sector OAB of a circle of radius r cm. The area of the sector is 15 cm^2 and $\angle AOB = 1.5$ radians.

(a) Prove that $r = 2\sqrt{5}$. **(3 marks)**

(b) Find, in cm, the perimeter of the sector OAB. **(2 marks)**

The segment R, shaded in Fig 1, is enclosed by the arc AB and the straight line AB.

(c) Calculate, to 3 decimal places, the area of R. **(3 marks)**

---

6. The third and fourth terms of a geometric series are 6.4 and 5.12 respectively.

Find

(*a*) the common ratio of the series, **(2 marks)**

(*b*) the first term of the series, **(2 marks)**

(*c*) the sum to infinity of the series. **(2 marks)**

(*d*) Calculate the difference between the sum to infinity of the series and the sum of the first 25 terms of the series. **(4 marks)**

---

7. $f(x) = 5\sin 3x°, \quad 0 \leq x \leq 180.$

(a) Sketch the graph of $f(x)$, indicating the value of x at each point where the graph intersects the x-axis **(3 marks)**

(b) Write down the coordinates of all the maximum and minimum points of $f(x)$. **(3 marks)**

(c) Calculate the values of x for which $f(x) = 2.5$ **(4 marks)**

---

8. (i) Solve, for $0° < x < 180°$, the equation

$$\sin (2x + 50°) = 0.6,$$

giving your answers to 1 decimal place. **(7 marks)**

(ii) In the triangle ABC, $AC = 18$ cm, $\angle ABC = 60°$ and $\sin A = \frac{1}{3}$.

(*a* Use the sine rule to show that $BC = 4\sqrt{3}$. **(4 marks)**

(*b*) Find the exact value of $\cos A$. **(2 marks)**

---

9. **Figure 2**

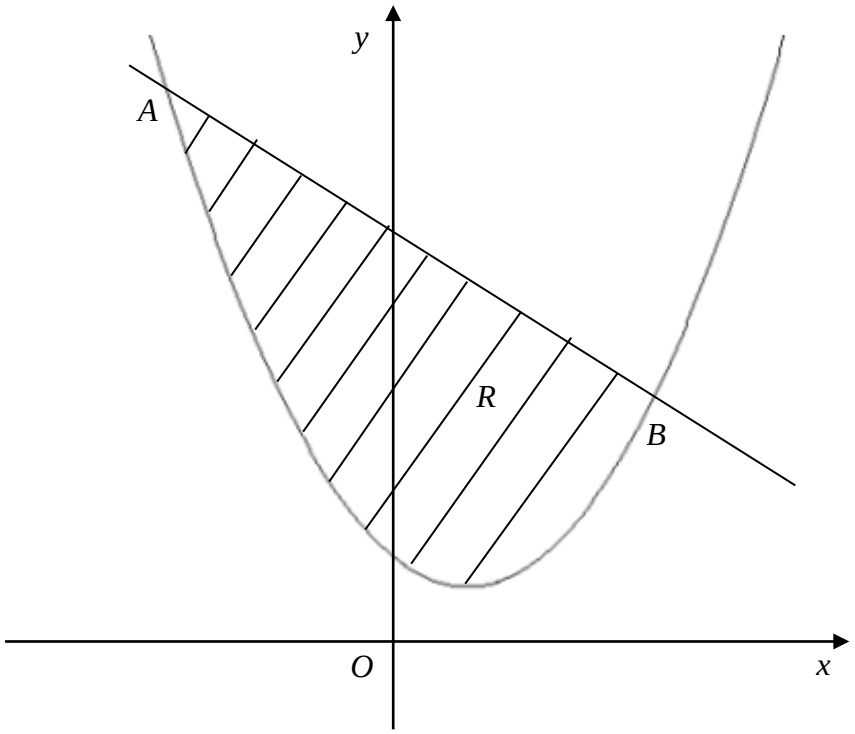

Figure 2 shows the line with equation $y = 9 - x$ and the curve with equation $y = x^2 - 2x + 3$. The line and the curve intersect at the points A and B, and O is the origin.

(a) Calculate the coordinates of A and the coordinates of B. **(5 marks)**

The shaded region R is bounded by the line and the curve.

(b) Calculate the area of R. **(7 marks)**

END