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

Surname	Initial(s)
Signature	

Paper Reference(s)

6663

Edexcel GCE

Core Mathematics C1

Advanced Subsidiary

Set A: Practice Paper 4

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

Calculators may NOT be used in this examination.

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 seven 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*) Solve the inequality

$$3x - 8 > x + 13.$$

(2)

(*b*) Solve the inequality

$$x^2 - 5x - 14 > 0.$$

(3)

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2. Given that $2^x = \frac{1}{\sqrt{2}}$ and $2^y = 4\sqrt{2}$,

(*a*) find the exact value of x and the exact value of y,

(3)

(*b*) calculate the exact value of 2^{y-x}.

(2)

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3. (*a*) Prove, by completing the square, that the roots of the equation $x^2 + 2kx + c = 0$, where k and c are constants, are $-k \pm \sqrt{(k^2 - c)}$.

(4)

The equation $x^2 + 2kx \pm 81 = 0$ has equal roots.

(*b*) Find the possible values of k.

(2)

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4. In the first month after opening, a mobile phone shop sold 280 phones. A model for future trading assumes that sales will increase by x phones per month for the next 35 months, so that $(280 + x)$ phones will be sold in the second month, $(280 + 2x)$ in the third month, and so on.

Using this model with $x = 5$, calculate

(a) (i) the number of phones sold in the 36th month,

(2)

(ii) the total number of phones sold over the 36 months.

(2)

The shop sets a sales target of 17 000 phones to be sold over the 36 months.

Using the same model,

(b) find the least value of x required to achieve this target.

(4)

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5. **Figure 1**

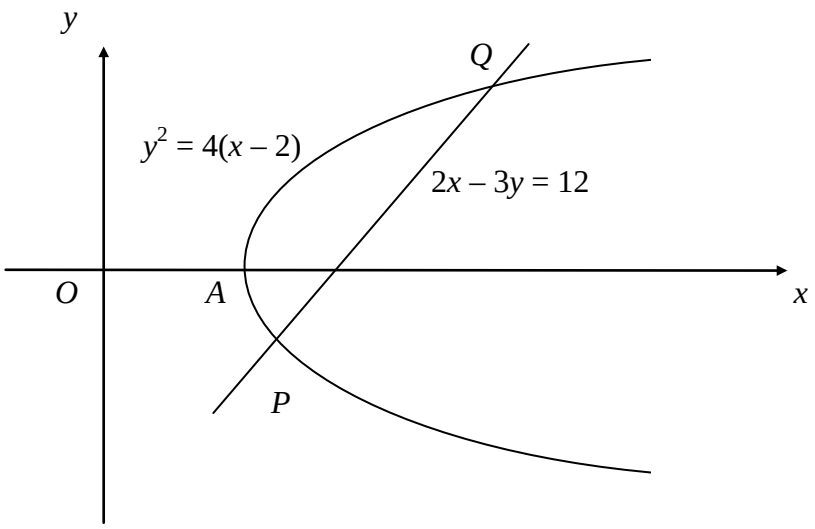


Figure 1 shows the curve with equation $y^2 = 4(x - 2)$ and the line with equation $2x - 3y = 12$.

The curve crosses the x-axis at the point A, and the line intersects the curve at the points P and Q.

(a) Write down the coordinates of A.

(1)

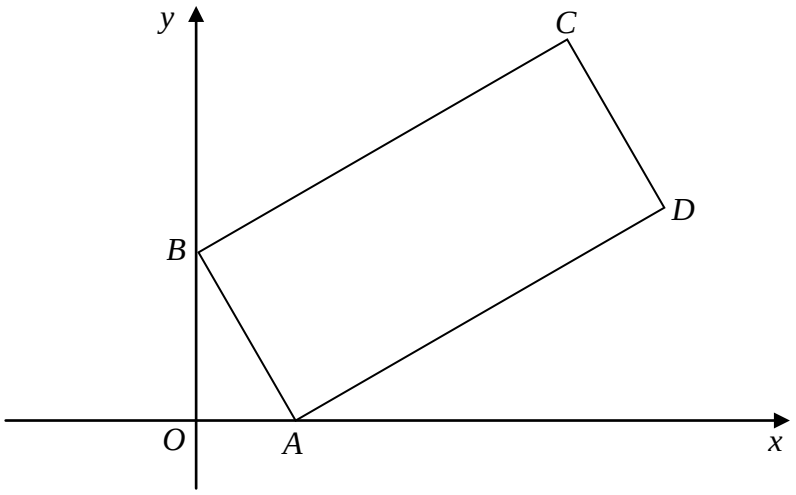
(b) Find, using algebra, the coordinates of P and Q.

(6)

(c) Show that $\angle PAQ$ is a right angle.

(4)

6. **Figure 2**



The points A (3, 0) and B (0, 4) are two vertices of the rectangle $ABCD$, as shown in Fig. 2.

(a) Write down the gradient of AB and hence the gradient of BC.

(3)

The point C has coordinates (8, k), where k is a positive constant.

(b) Find the length of BC in terms of k.

(2)

Given that the length of BC is 10 and using your answer to part (b),

(c) find the value of k,

(4)

(d) find the coordinates of D.

(2)

7. The curve C has equation $y = f(x)$. Given that

$$\frac{dy}{dx} = 3x^2 - 20x + 29$$

and that C passes through the point $P(2, 6)$,

(a) find y in terms of x.

(4)

(b) Verify that C passes through the point $(4, 0)$.

(2)

(c) Find an equation of the tangent to C at P.

(3)

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

(d) Calculate the exact x-coordinate of Q.

(5)

END