

Candidate forename		Candidate surname	
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Centre number						Candidate number				
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**OXFORD CAMBRIDGE AND RSA EXAMINATIONS**  
**GCSE**  
**B280B**  
**MATHEMATICS C**  
**(GRADUATED ASSESSMENT)**  
**MODULE M10 – SECTION B**

**MONDAY 16 JANUARY 2012: Morning**  
**DURATION: 30 minutes**

**SUITABLE FOR VISUALLY IMPAIRED CANDIDATES**

**Candidates answer on the Question Paper.**

**OCR SUPPLIED MATERIALS:**

**None**

**OTHER MATERIALS REQUIRED:**

**Geometrical instruments**  
**Tracing paper (optional)**  
**Scientific or graphical calculator**

**READ INSTRUCTIONS OVERLEAF**

## **INSTRUCTIONS TO CANDIDATES**

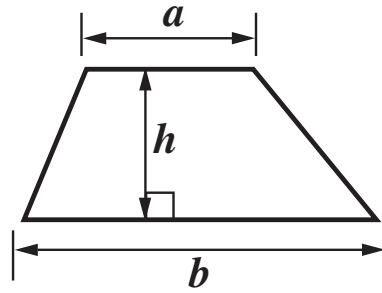
- Write your name, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer ALL the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Show your working. Marks may be given for a correct method even if the answer is incorrect.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).

## **INFORMATION FOR CANDIDATES**

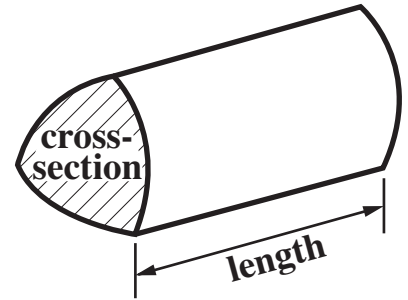
- The number of marks is given in brackets [ ] at the end of each question or part question.
- Section B starts with question 8.
- You are expected to use a calculator in Section B of this paper.
- Use the  $\pi$  button on your calculator or take  $\pi$  to be 3.142 unless the question says otherwise.
- The total number of marks for this Section is 25.

# FORMULAE SHEET

Area of trapezium =  $\frac{1}{2} (a + b)h$



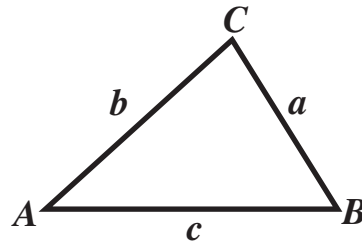
Volume of prism = (area of cross-section)  $\times$  length



In any triangle  $ABC$

Sine rule  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

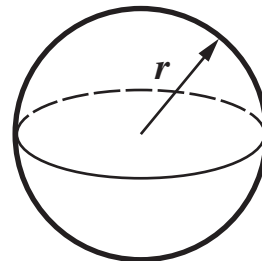
Cosine rule  $a^2 = b^2 + c^2 - 2bc \cos A$



Area of triangle =  $\frac{1}{2} ab \sin C$

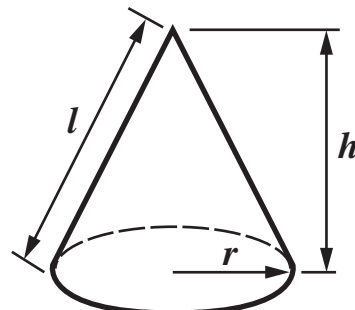
Volume of sphere =  $\frac{4}{3}\pi r^3$

Surface area of sphere =  $4\pi r^2$



Volume of cone =  $\frac{1}{3}\pi r^2 h$

Curved surface area of cone =  $\pi r l$



The Quadratic Equation

The solutions of  $ax^2 + bx + c = 0$ , where  $a \neq 0$ , are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

**8** The amount, £ $A$ , in a bank account  $t$  years after it was opened is given by this formula.

$$A = 35\,000 \times 1.052^t$$

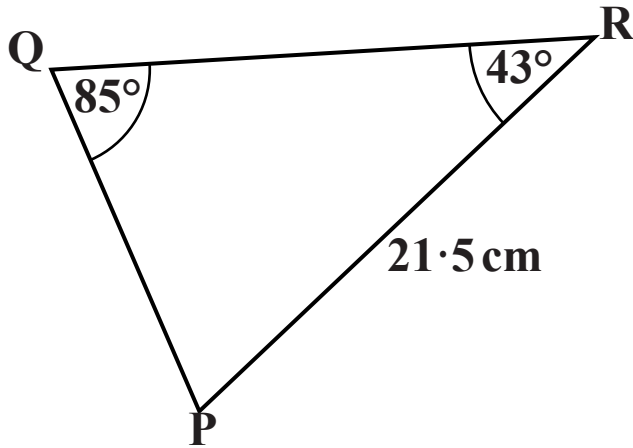
- (a)** What was the amount 3 years after the account was opened?  
Give your answer to the nearest pound.

**(a)** £ \_\_\_\_\_ **[1]**

**(b) How many years after the account was opened does the amount become greater than £50 000?**

**(b) \_\_\_\_\_ years [2]**

9 This is a sketch of the triangle PQR.



NOT TO SCALE

Calculate the area of triangle PQR.

\_\_\_\_\_  $\text{cm}^2$  [5]

**10 Solve algebraically these simultaneous equations.**

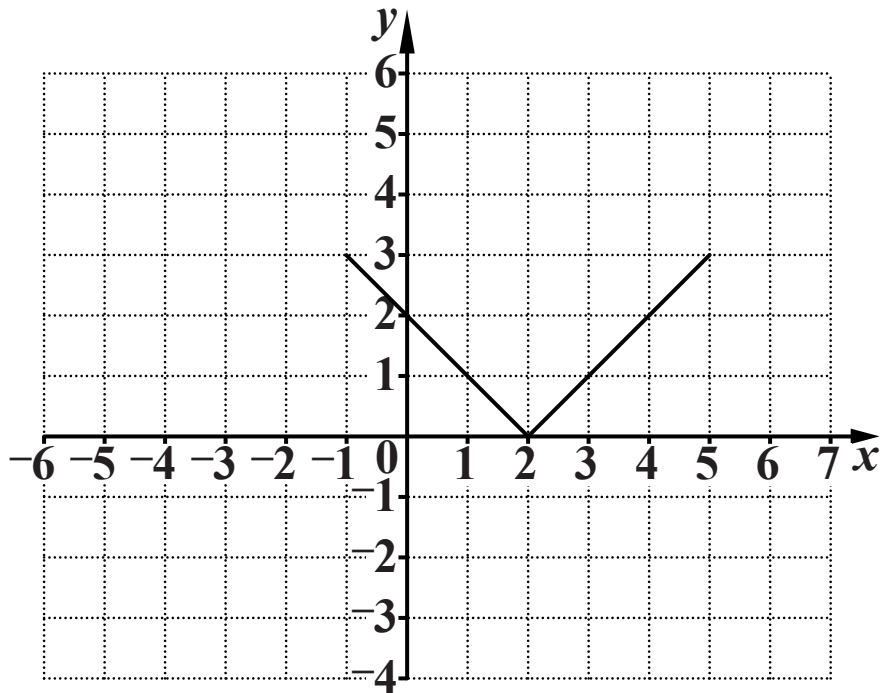
$$y = x - 2$$

$$x^2 + y^2 = 34$$

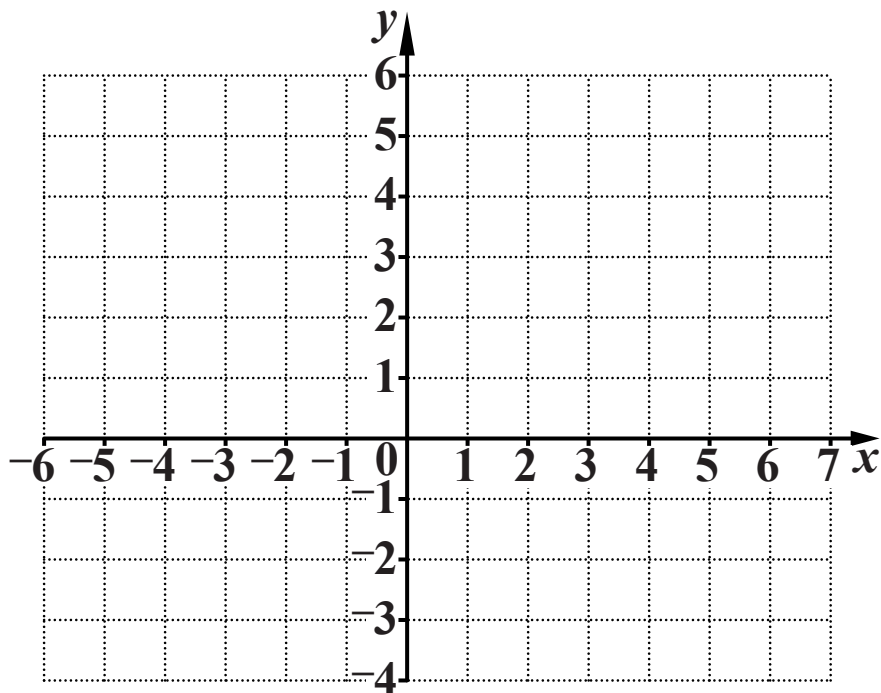
$$x = \underline{\hspace{2cm}}, y = \underline{\hspace{2cm}}$$

$$x = \underline{\hspace{2cm}}, y = \underline{\hspace{2cm}} [6]$$

11 This is the graph of  $y = f(x)$ .



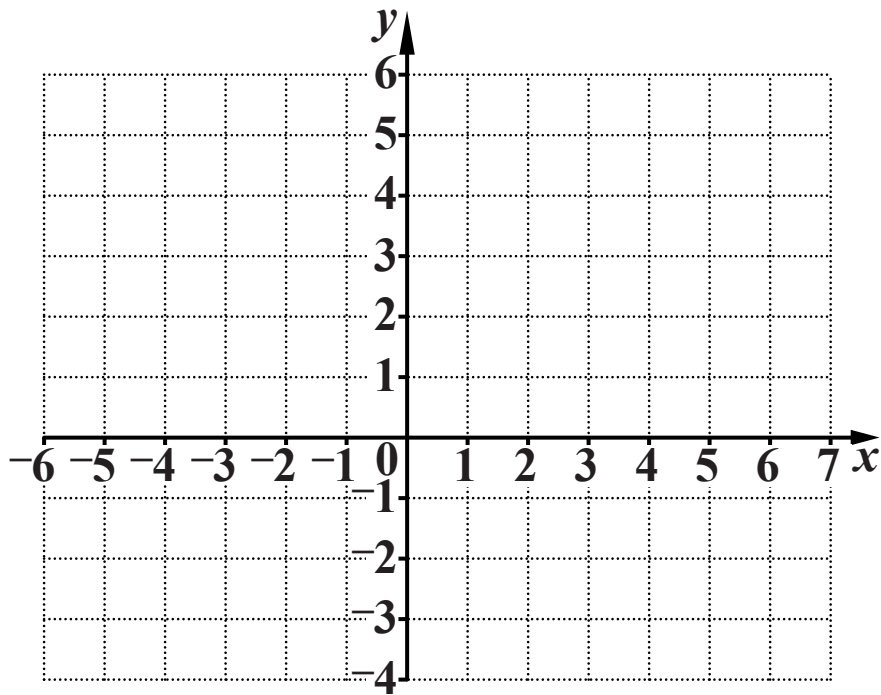
(a) On the grid below, draw the graph of  $y = f(x) - 3$ .



[1]



(b) On the grid below, draw the graph of  $y = f(x + 3)$ .

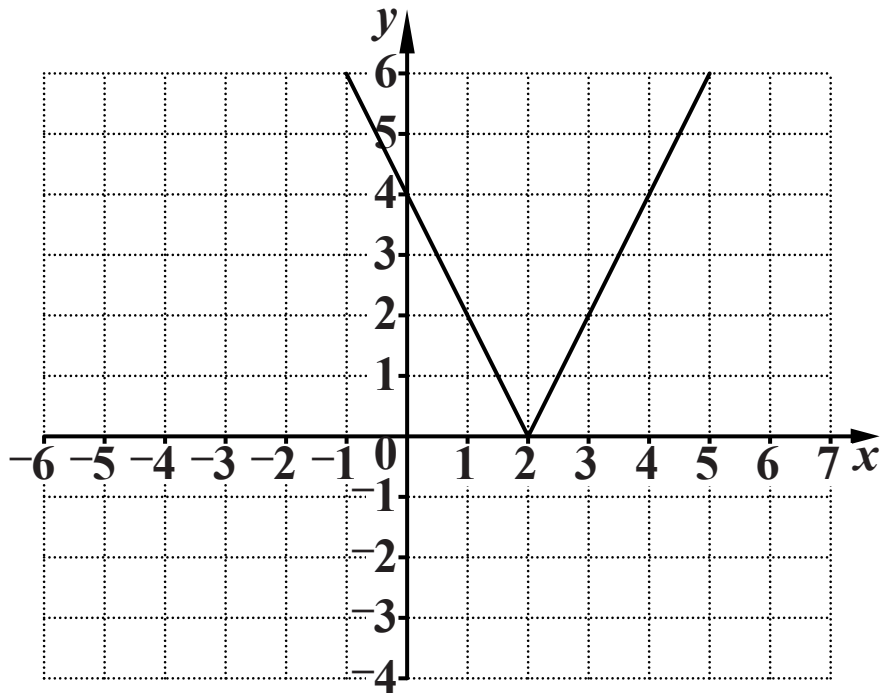


[1]

(c) The graph below is a transformation of  $y = f(x)$ .

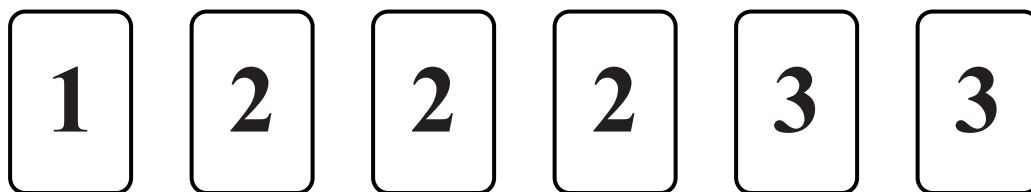
Circle the correct equation for this graph.

$y = f(x - 2)$      $y = f(x) - 2$      $y = 2f(x)$      $y = f(2x)$      $y = \frac{1}{2}f(x)$



[1]

**12** These six cards are shuffled and placed face down.



**Teresa picks a card at random.**

**She does not replace the card.**

**She then picks another card at random.**

**What is the probability that the number on the second card is lower than the number on the first card?**

\_\_\_\_\_ [4]

**13 (a) By completing the square, express  $x^2 - 6x + 7$  in the form  $(x - a)^2 + b$ .**

**(a) \_\_\_\_\_ [3]**

**(b) Hence state the minimum value of  $x^2 - 6x + 7$ .**

**(b) \_\_\_\_\_ [1]**

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