Candidate forename		Candidate surname	

Centre number						Candidate number				

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

DC (CW/SW) 12MEP01223 57707

INSTRUCTIONS TO CANDIDATES

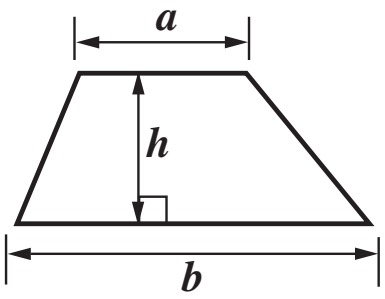
- **Write your name, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.**
- **Use black ink. HB pencil may be used for graphs and diagrams only.**
- **Answer ALL the questions.**
- **Read each question carefully. Make sure you know what you 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

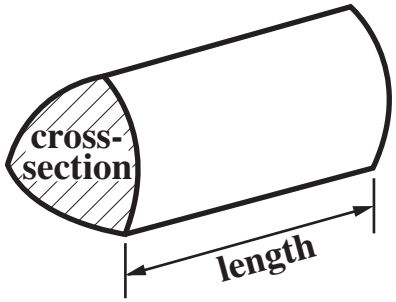
- **The number of marks is given in brackets [ ] at the end of each question or part question.**
- **Section B starts with question 8.**
- **You are expected to use a calculator in Section B of this paper.**
- **Use the π button on your calculator or take π to be 3·142 unless the question says otherwise.**
- **The total number of marks for this Section is 25.**

FORMULAE SHEET

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



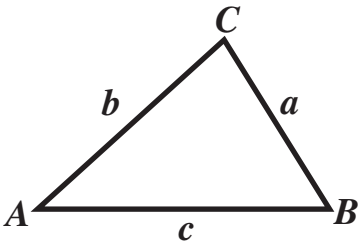
Volume of prism = (area of cross-section) × length



In any triangle ABC

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

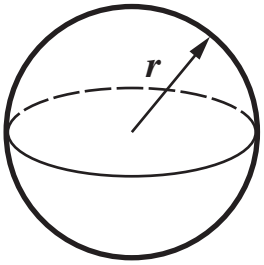
Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$



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

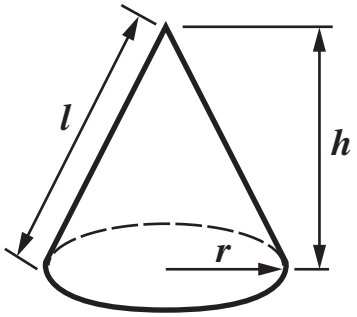
Volume of sphere $= \frac{4}{3}\pi r^3$

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



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

Curved surface area of cone $= \pi rl$



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.**

$$A = 35\,000 \times 1{\cdot}052^{t}$$

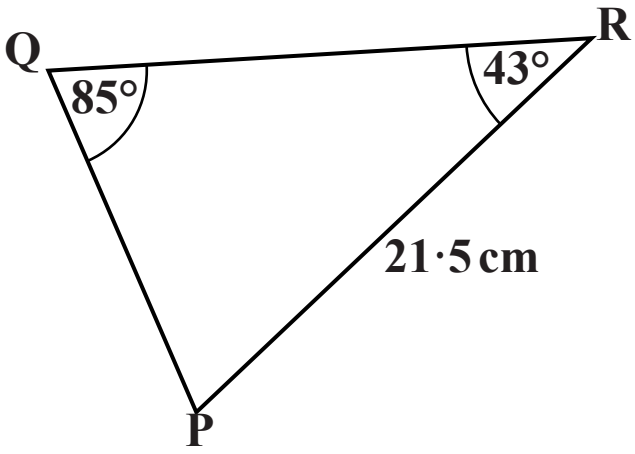
(a) What was the amount 3 years after the account was opened?
Give your answer to the nearest pound.

(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.

_____ **cm^2 [5]**

10 Solve algebraically these simultaneous equations.

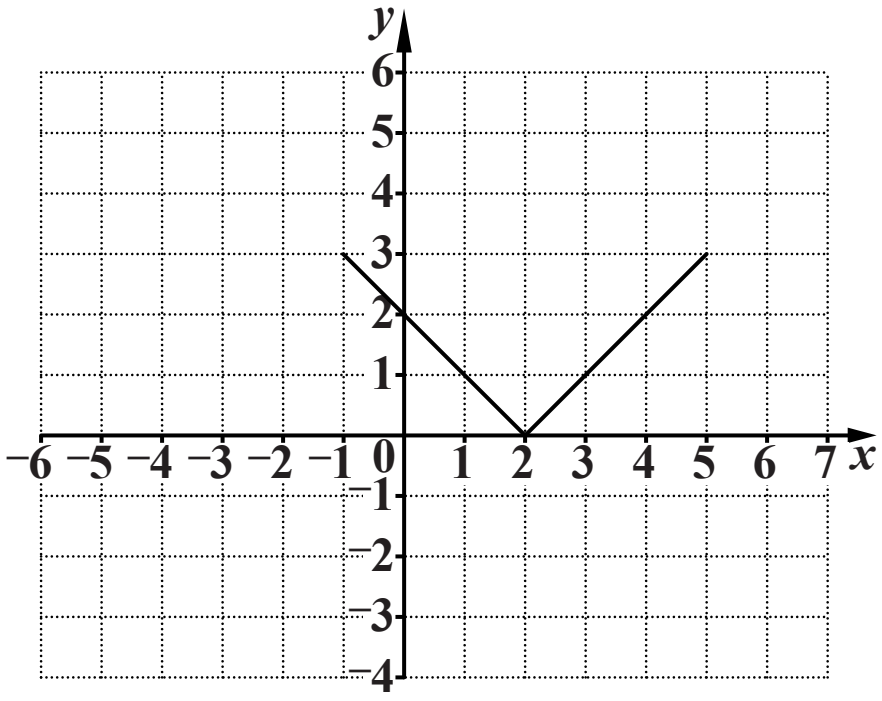
$$y = x - 2$$

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

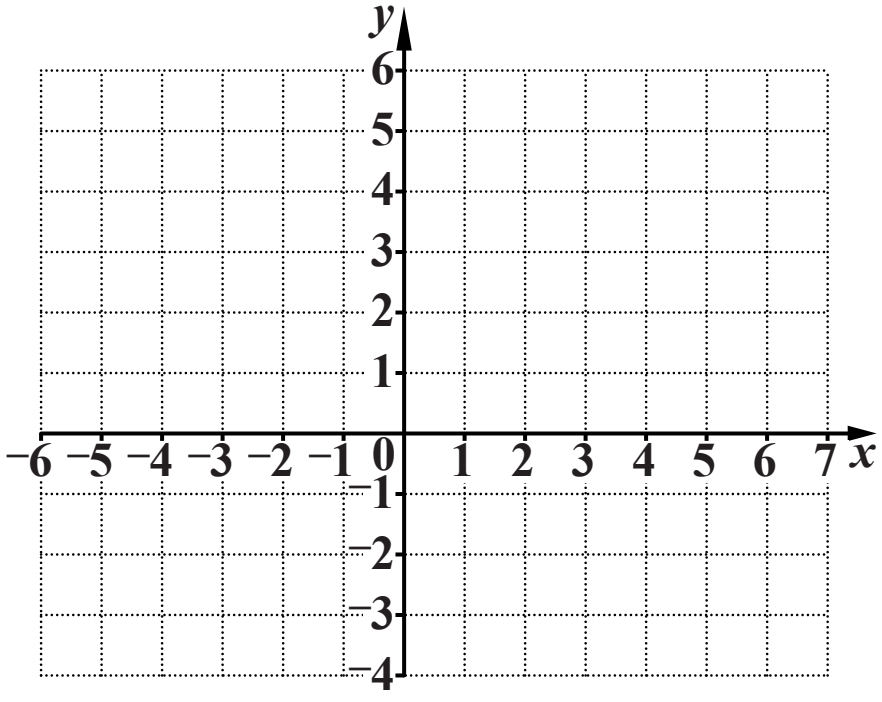
$x =$ _____ , $y =$ _____

$x =$ _____ , $y =$ _____ **[6]**

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

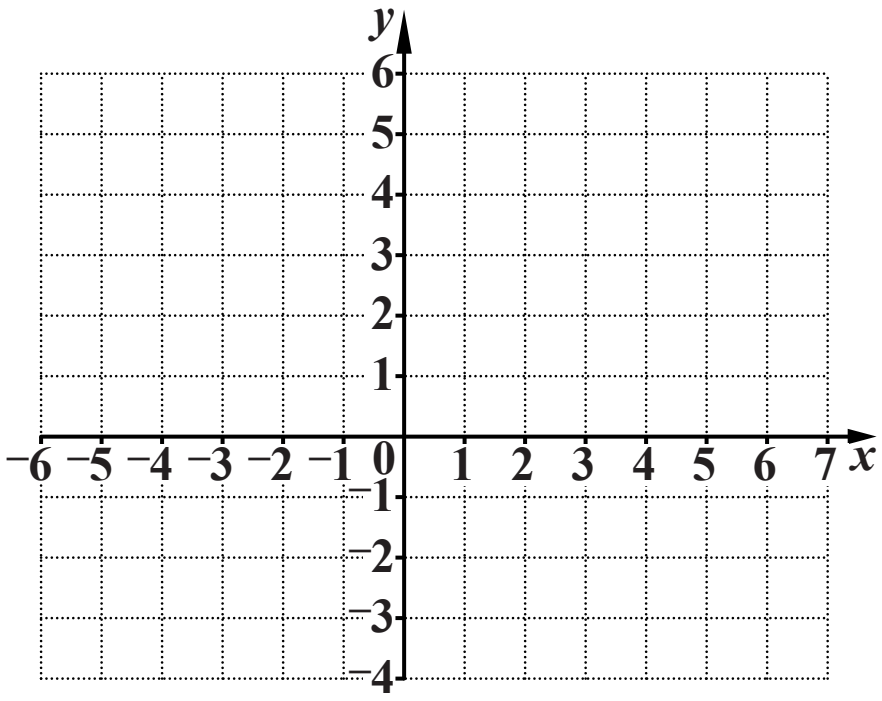


(a) On the grid below, draw the graph of $y = f(x) - 3$.



[1]

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

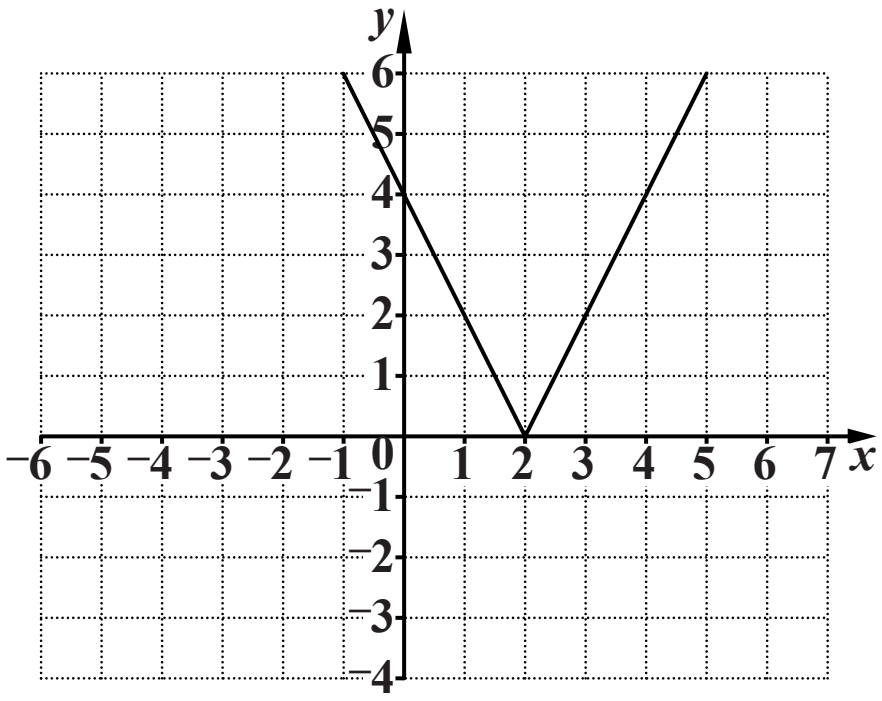


[1]

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

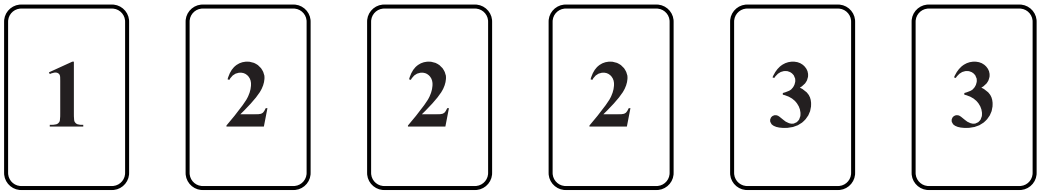
Circle the correct equation for this graph.

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



[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]

BLANK PAGE

BLANK PAGE

BLANK PAGE