Please check the examination details below before entering your candidate information

Candidate surname	Other names

Pearson Edexcel International GCSE

Centre Number | Candidate Number

Tuesday 15 January 2019

Morning (Time: 2 hours) | Paper Reference **4MA0/4H**

Mathematics A

Paper 4H
Higher Tier

You must have:
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Without sufficient working, correct answers may be awarded no marks.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators may be used.**
- You must **NOT** write anything on the formulae page.
  Anything you write on the formulae page will gain NO credit.

Information

- The total mark for this paper is 100.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.

Turn over ▶

P55649A

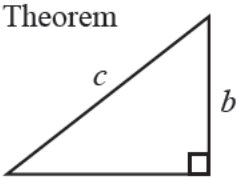
5/3/1/1/

P 5 5 6 4 9 A 0 1 2 4

Pearson

International GCSE MATHEMATICS
FORMULAE SHEET – HIGHER TIER

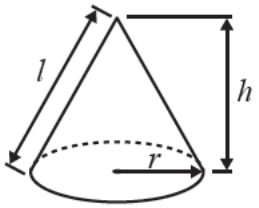
Pythagoras' Theorem



$a^2 + b^2 = c^2$

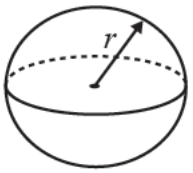
Volume of cone = $\frac{1}{3}\pi r^2 h$

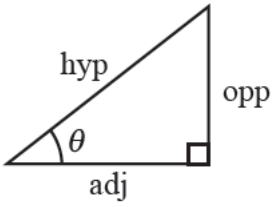
Curved surface area of cone = $\pi r l$



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

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





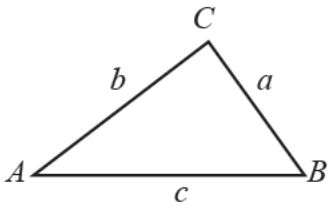
adj = hyp × cos θ
opp = hyp × sin θ
opp = adj × tan θ

or $\sin\theta = \frac{\text{opp}}{\text{hyp}}$

$\cos\theta = \frac{\text{adj}}{\text{hyp}}$

$\tan\theta = \frac{\text{opp}}{\text{adj}}$

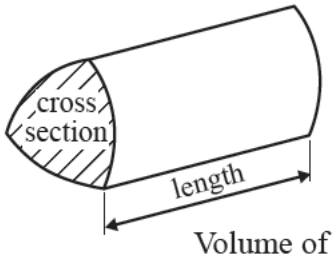
In any triangle ABC



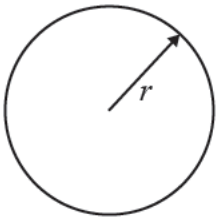
Sine rule: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

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

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



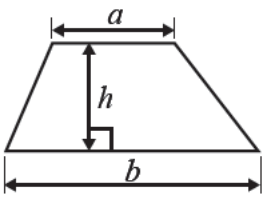
Volume of prism = area of cross section × length

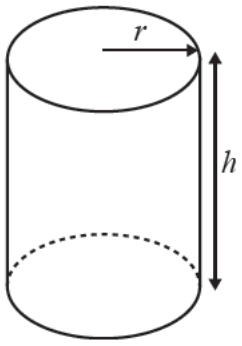


Circumference of circle = $2\pi r$

Area of circle = πr^2

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





Volume of cylinder = $\pi r^2 h$

Curved surface area of cylinder = $2\pi rh$

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

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

Answer ALL TWENTY THREE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 The table gives information about the ingredients needed to make 20 cookies.

Ingredient	Weight (grams)
Butter	125
Sugar	100
Flour	240
Nuts	75

(a) Work out the weight of flour needed to make 30 of these cookies.

grams

(2)

Nusret is making some of these cookies.
He uses 150 grams of butter.

(b) Work out the weight of sugar he needs.

grams

(2)

(c) Using the information given in the table, write down the ratio of the weight of butter to the weight of nuts.
Give your answer in the form 1 : n

1:

(2)

(Total for Question 1 is 6 marks)

2 The diagram shows the positions of points A, B, C and D on a map.

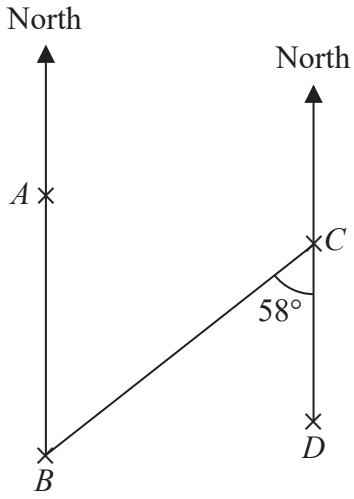


Diagram **NOT** accurately drawn

A is due north of B.
D is due south of C.
Angle $BCD = 58°$

(a) (i) Write down the size of angle ABC.

°

(ii) Give a reason for your answer.

(2)

(b) Find the bearing of B from C.

°

(2)

(Total for Question 2 is 4 marks)

3 When a drawing pin is dropped onto the floor, it can land either point up or point down.
The probability that it will land point up is 0.43

(a) Find the probability that it will land point down.

(2)

The drawing pin is dropped onto the floor 200 times.

(b) Work out an estimate for the number of times that the drawing pin will land point up.

(2)

(Total for Question 3 is 4 marks)

4 (a) Expand $y(3x + y)$

(2)

$f = g^2 - 4h$

(b) Find the value of f when $g = 6$ and $h = -5$

$f =$

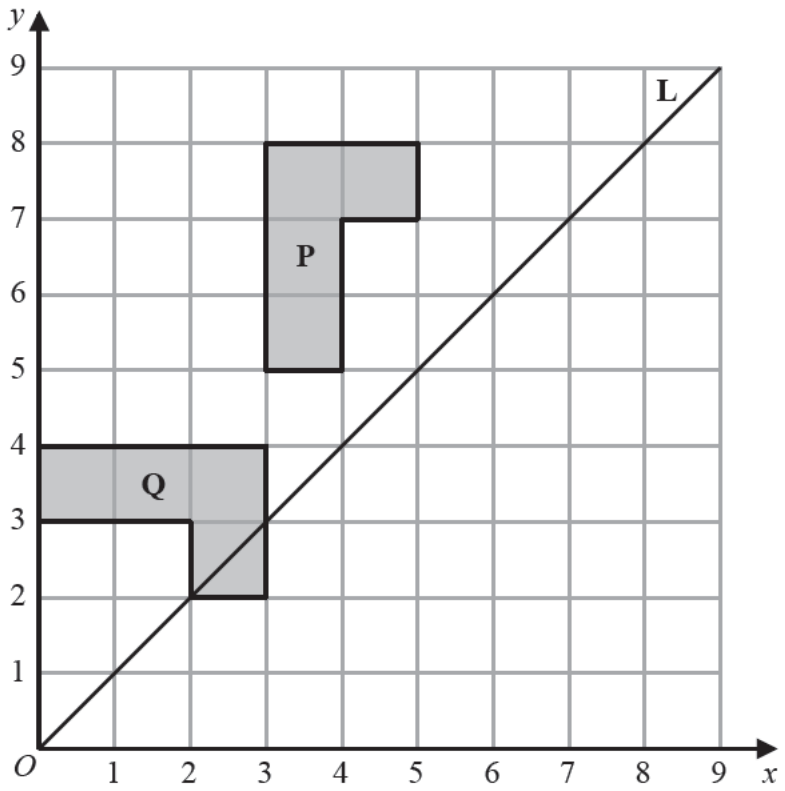
(2)

(c) Solve the inequality $8w + 7 < 41$

(2)

(Total for Question 4 is 6 marks)

5 The diagram shows a shape **P**, a shape **Q** and a line **L**.



(a) Reflect shape **P** in the line **L**.

(2)

(b) Describe fully the single transformation that maps shape **P** onto shape **Q**.

(3)

(Total for Question 5 is 5 marks)

6 The table gives information about the examination scores of 30 students.

Score	Frequency
1 – 20	1
21 – 40	5
41 – 60	8
61 – 80	10
81 – 100	6

Work out an estimate for the mean score of the 30 students.

(Total for Question 6 is 4 marks)

7 The diagram shows a rectangle $ABCD$.

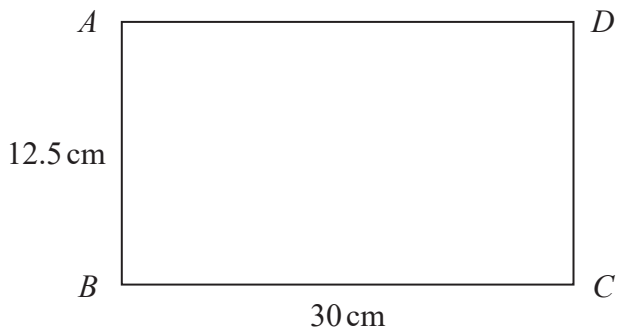


Diagram **NOT** accurately drawn

Work out the length of AC.

cm

(Total for Question 7 is 3 marks)

8 (a) Express 980 as a product of powers of its prime factors.
Show your working clearly.

(3)

(b) Simplify $\dfrac{3^4 \times 3^7}{3^5}$

Give your answer as a single power of 3

(2)

(Total for Question 8 is 5 marks)

9 Solve

$$y = 3x$$
$$7x + y = 25$$

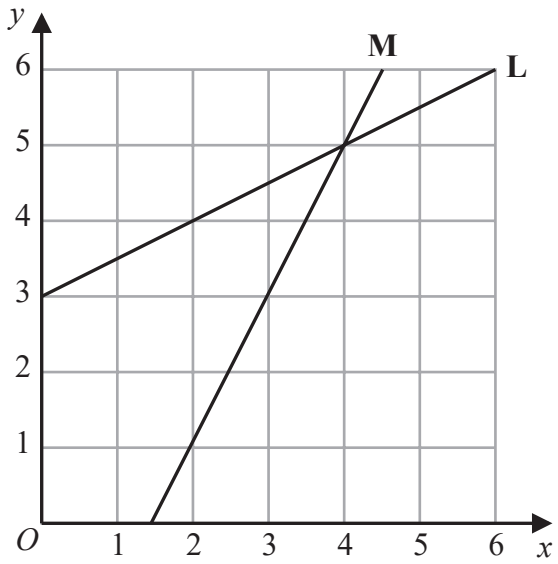
Show clear algebraic working.

$x =$

$y =$

(Total for Question 9 is 3 marks)

10 The diagram shows line **L** and line **M** on a grid.



L has equation $y = \frac{1}{2}x + 3$

M has equation $y = 2x - 3$

Show, by shading on the grid, the region defined by all three of the inequalities

$$y < \frac{1}{2}x + 3 \qquad y > 2x - 3 \qquad x + y > 4$$

Label your region **R**.

(Total for Question 10 is 2 marks)

11 The diagram shows a regular pentagon *ABCDE*, a regular hexagon *AEFGHJ* and a triangle *ABJ*.

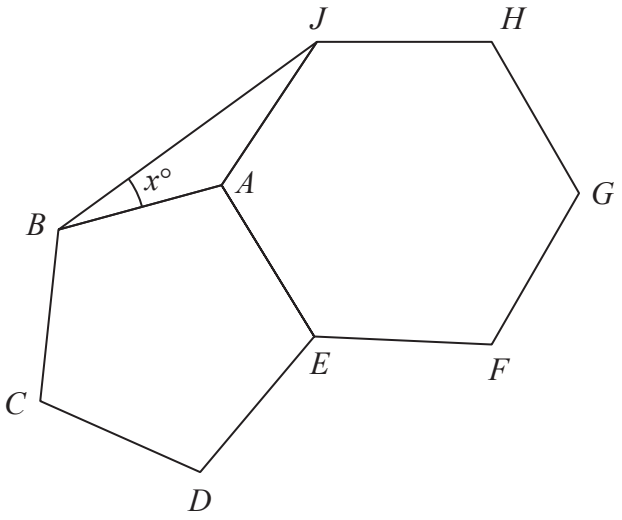


Diagram **NOT** accurately drawn

Work out the value of *x*.

x =

(Total for Question 11 is 5 marks)

12 Point A has coordinates (4, 1)
Point B has coordinates (8, –2)

A and B lie on the straight line **L**.

(a) Work out the gradient of **L**.

(2)

(b) Find an equation for **L**.
Give your answer in the form $ax + by = c$ where a, b and c are integers.

(3)

The straight line **M** is parallel to **L** and passes through the point (0, 7)

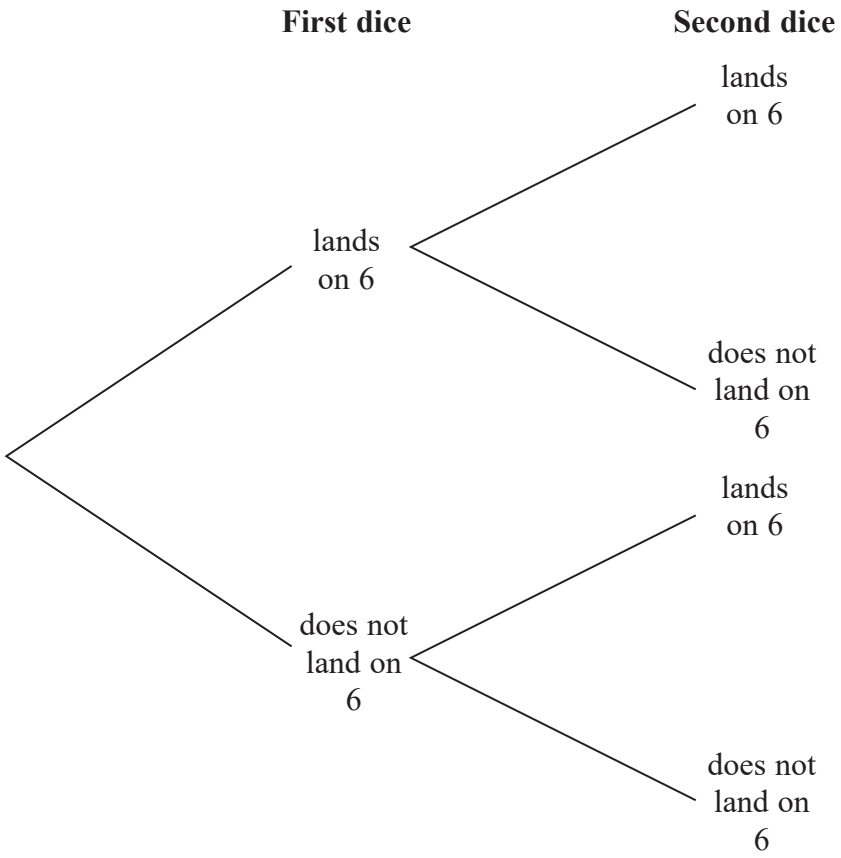
(c) Write down an equation for **M**.

(1)

(Total for Question 12 is 6 marks)

13 Yanira throws two fair dice.
She records the number on which each dice lands.

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that both dice land on 6

(1)

Yanira throws a third fair dice.

(c) Work out the probability that at least one of the **three** dice lands on 6

(3)

(Total for Question 13 is 6 marks)

14 (a) Write 6.3×10^5 as an ordinary number.

(1)

(b) Write 0.0072 in standard form.

(1)

(c) Work out $(9 \times 10^{65})^2$
Give your answer in standard form.

(2)

(Total for Question 14 is 4 marks)

15 d is proportional to t^2

$d = 12.5$ when $t = 5$

(a) Find an equation for d in terms of t.

(3)

(b) Work out the value of d when $t = 9$

$d =$

(1)

(Total for Question 15 is 4 marks)

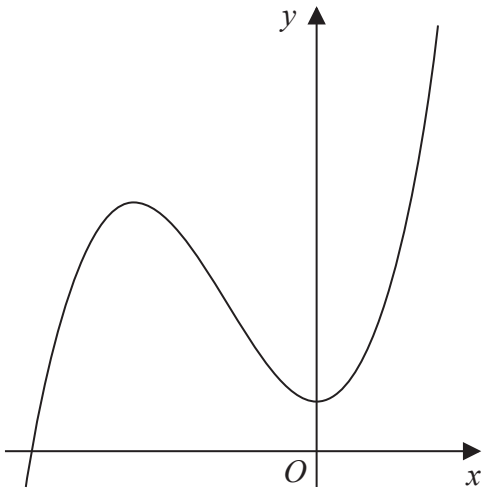
16 The curve **C** has equation $y = x^3 + 3x^2 + 1$

(a) Find $\dfrac{dy}{dx}$

$\dfrac{dy}{dx} =$

(2)

The diagram shows a sketch of the curve **C**.



(b) Work out the coordinates of the two turning points of **C**.
Show clear algebraic working.

Minimum (,)

Maximum (,)

(4)

(Total for Question 16 is 6 marks)

17 Factorise fully $18x^2 - 32$

(Total for Question 17 is 2 marks)

18 A, B, D and E are points on a circle.
ABC and EDC are straight lines.

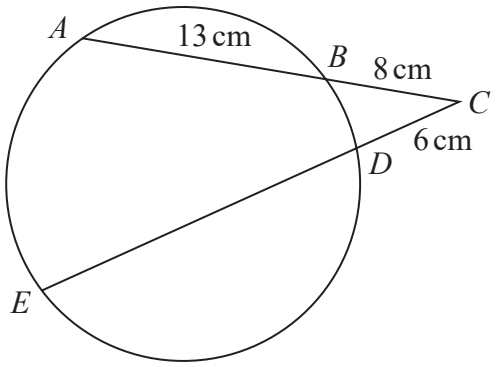


Diagram **NOT** accurately drawn

$AB = 13$ cm
$BC = 8$ cm
$DC = 6$ cm

Work out the length of ED.

cm

(Total for Question 18 is 3 marks)

19 The diagram shows a solid cylinder.

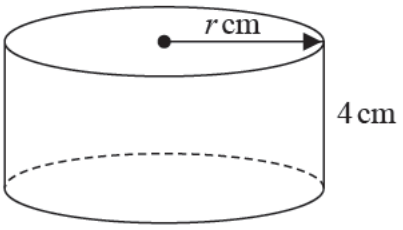


Diagram **NOT** accurately drawn

The cylinder has height 4 cm and radius r cm.

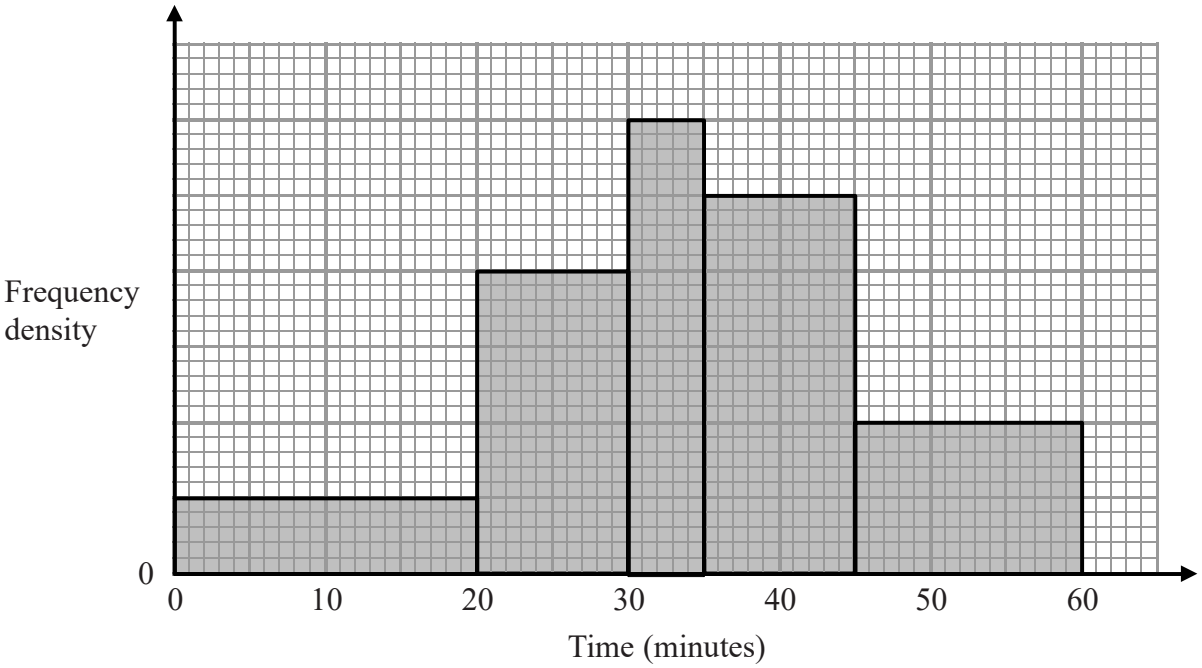
The total area of the two circular faces of the cylinder is 10π cm^2 greater than the curved surface area of the cylinder.

Work out the value of r.

$r =$

(Total for Question 19 is 4 marks)

20 Jill reads each day.
The histogram gives information about the time, in minutes, that she spent reading on each of 85 days.



(a) Find the number of days on which Jill read for between 30 and 35 minutes.

(2)

(b) Find an estimate for the number of days on which Jill read for less than 33 minutes.

(2)

(Total for Question 20 is 4 marks)

21 The diagram shows a solid cone.

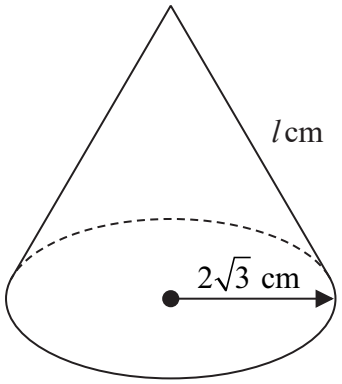


Diagram **NOT** accurately drawn

The radius of the base of the cone is $2\sqrt{3}$ cm.
The slant height of the cone is l cm.
The **total** surface area of the cone is 36π cm^2

Work out the exact value of l.

Give your answer in the form $2\sqrt{a}$ where a is an integer.

$l =$

(Total for Question 21 is 5 marks)

22 The diagram shows a triangular prism.

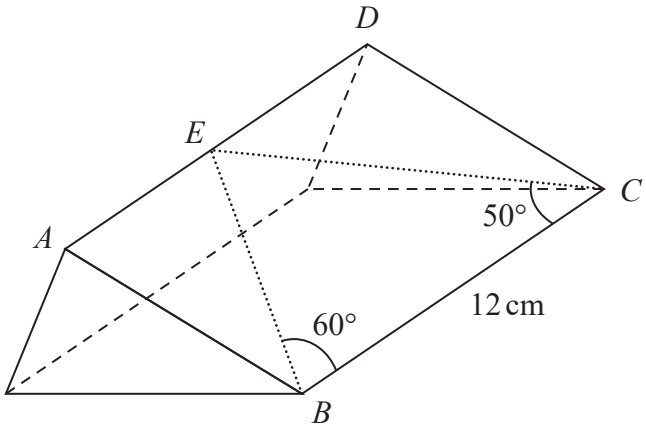


Diagram **NOT** accurately drawn

The point E lies on AD.

Angle $EBC = 60°$ Angle $ECB = 50°$ Angle $ABC = 90°$ Angle $BAD = 90°$
$BC = 12$ cm

Work out the length of AB.
Give your answer correct to 3 significant figures.

cm

(Total for Question 22 is 4 marks)

23 Solve

$$2x^2 + y^2 = 15$$
$$x = y - 3$$

Show your working clearly.
Give your solutions correct to 3 decimal places.

(Total for Question 23 is 5 marks)

TOTAL FOR PAPER IS 100 MARKS

BLANK PAGE

Do NOT write on this page.