

Please check the examination details below before entering your candidate information

Candidate surname		Other names	
Pearson Edexcel		Centre Number	Candidate Number
International GCSE			
Monday 7 January 2019			
Morning (Time: 2 hours)		Paper Reference 4MA0/3H	
Mathematics A			
Paper 3H			
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 ►

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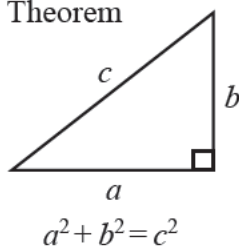
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Pearson

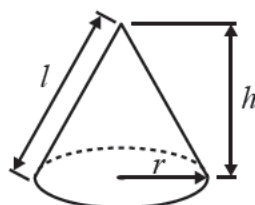
International GCSE MATHEMATICS FORMULAE SHEET – HIGHER TIER

Pythagoras' Theorem



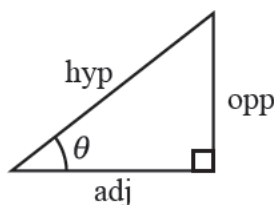
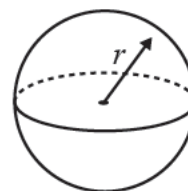
$$\text{Volume of cone} = \frac{1}{3} \pi r^2 h$$

$$\text{Curved surface area of cone} = \pi r l$$



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

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



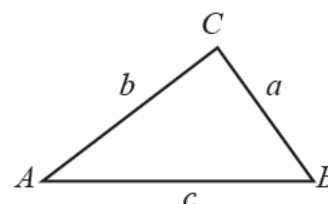
$$\begin{aligned} \text{adj} &= \text{hyp} \times \cos \theta \\ \text{opp} &= \text{hyp} \times \sin \theta \\ \text{opp} &= \text{adj} \times \tan \theta \end{aligned}$$

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

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

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

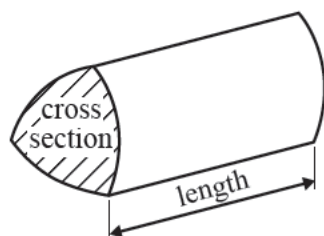
In any triangle ABC



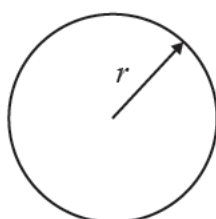
$$\text{Sine rule: } \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

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

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



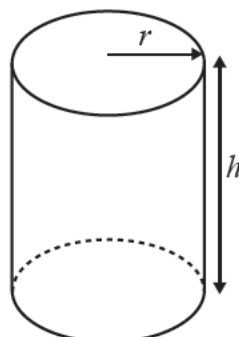
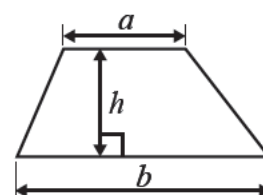
$$\text{Volume of prism} = \text{area of cross section} \times \text{length}$$



$$\text{Circumference of circle} = 2 \pi r$$

$$\text{Area of circle} = \pi r^2$$

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



$$\text{Volume of cylinder} = \pi r^2 h$$

$$\text{Curved surface area of cylinder} = 2 \pi r h$$

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 FOUR questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1** Jerry drove 315 kilometres from London to Leeds.
His average speed was 75 km/h.

Work out how long it took Jerry to drive from London to Leeds.
Give your answer in hours and minutes.

hours

minutes

(Total for Question 1 is 3 marks)

- 2** Point A has coordinates $(4, -1)$
Point B has coordinates $(9, 7)$

Work out the coordinates of the midpoint of the line AB .

(,)

(Total for Question 2 is 2 marks)



P 5 5 6 4 2 A 0 3 2 4

3 $\mathcal{E} = \{\text{whole numbers from 3 to 18}\}$

$$A = \{3, 6, 9, 18\}$$

$$B = \{3, 6, 9, 12, 15\}$$

$$C = \{6, 12, 18\}$$

(a) List the members of the set

(i) $A \cap B$

(ii) $A \cup C$

(2)

Sasha writes down

$$12 \notin A$$

(b) Is Sasha correct?

Give a reason for your answer.

(1)

(Total for Question 3 is 3 marks)

4 A circle has diameter 18 cm.

Work out the circumference of the circle.

Give your answer correct to 1 decimal place.

cm

(Total for Question 4 is 2 marks)



5 Josh has 40 counters in a bag.

In the bag, there are

18 red counters

13 blue counters

9 yellow counters

Josh puts some more **red** counters into the bag.

Josh is now going to take at random a counter from the bag.

The probability that he will take a red counter is $\frac{1}{2}$

Work out the probability that he will take a yellow counter.

(Total for Question 5 is 3 marks)



P 5 5 6 4 2 A 0 5 2 4

6 (a) Factorise $y^2 + y$

(1)

(b) Solve $3(m + 7) = 12 - 5m$
Show clear algebraic working.

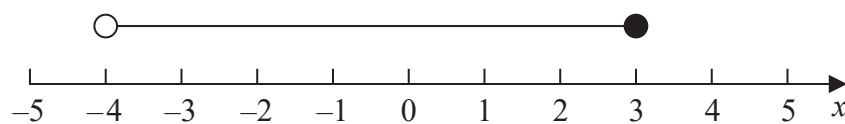
$m =$

(3)

(c) Expand and simplify $(g - 7)(g + 2)$

(2)

(d) Write down the inequality shown on this number line.



(2)

(Total for Question 6 is 8 marks)



- 7 There are 96 cards on a table.
Each card is either red or black.

The ratio of the number of red cards to the number of black cards is 5:7

There is a circle on 35% of the red cards.

There is a circle on $\frac{3}{14}$ of the black cards.

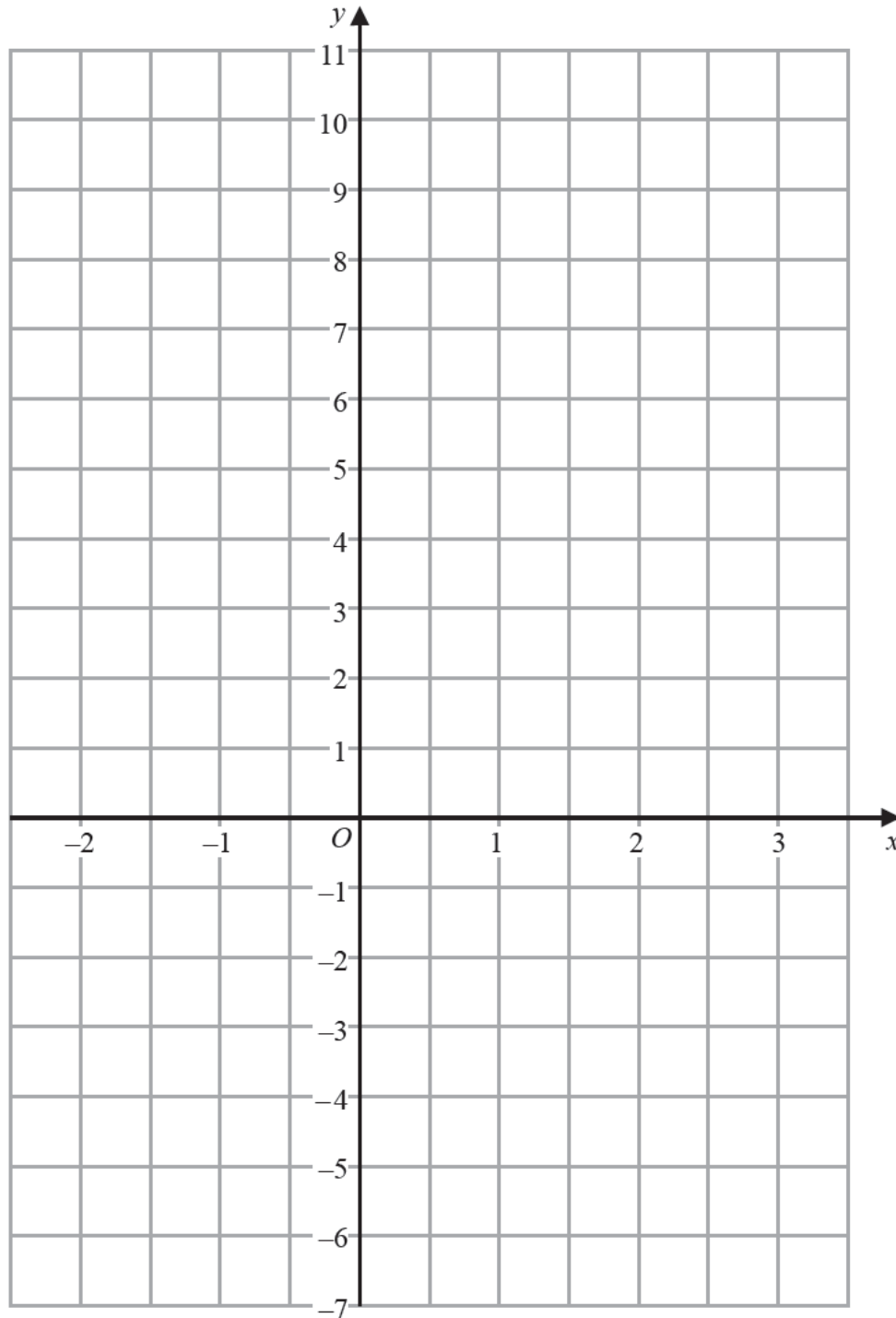
On how many of the 96 cards is there a circle?

(Total for Question 7 is 5 marks)



P 5 5 6 4 2 A 0 7 2 4

- 8 On the grid, draw the graph of $y + 3x = 4$ for values of x from -2 to 3



(Total for Question 8 is 3 marks)



9

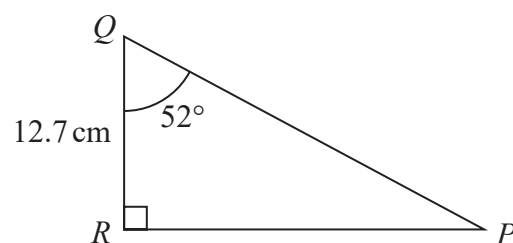


Diagram **NOT**
accurately drawn

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

cm

(Total for Question 9 is 3 marks)

- 10** Emily made 6 cakes.
It cost her a total of £7.60 to make the cakes.
Emily sold 2 of the cakes for £3.50 each.
She sold the other 4 cakes for £4.25 each.

Work out Emily's percentage profit.
Give your percentage correct to the nearest whole number.

%

(Total for Question 10 is 4 marks)



11 Here is a solid prism.

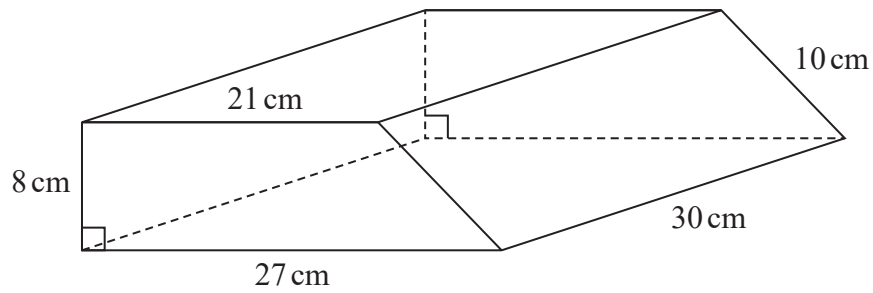


Diagram **NOT**
accurately drawn

The cross section of the prism is a trapezium.

Work out the total surface area of the prism.

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cm²

(Total for Question 11 is 3 marks)



- 12 There are 40 children at a kindergarten.
24 of the children are boys and 16 of the children are girls.

The boys have a mean height of 113 cm.

The girls have a mean height of 110 cm.

Calculate the mean height of all 40 children at the kindergarten.

cm

(Total for Question 12 is 3 marks)

- 13 Remi invests 18 000 dirham in a savings account for 3 years.
He gets 1.2% per year compound interest.

How much money will Remi have in his savings account at the end of the 3 years?

Give your answer to the nearest dirham.

dirham

(Total for Question 13 is 3 marks)



P 5 5 6 4 2 A 0 1 1 2 4

- 14 The grouped frequency table gives information about the distances that 120 people travel to get to work.

Distance (d km)	Frequency
$0 < d \leq 5$	8
$5 < d \leq 10$	20
$10 < d \leq 15$	27
$15 < d \leq 20$	29
$20 < d \leq 25$	18
$25 < d \leq 30$	11
$30 < d \leq 35$	7

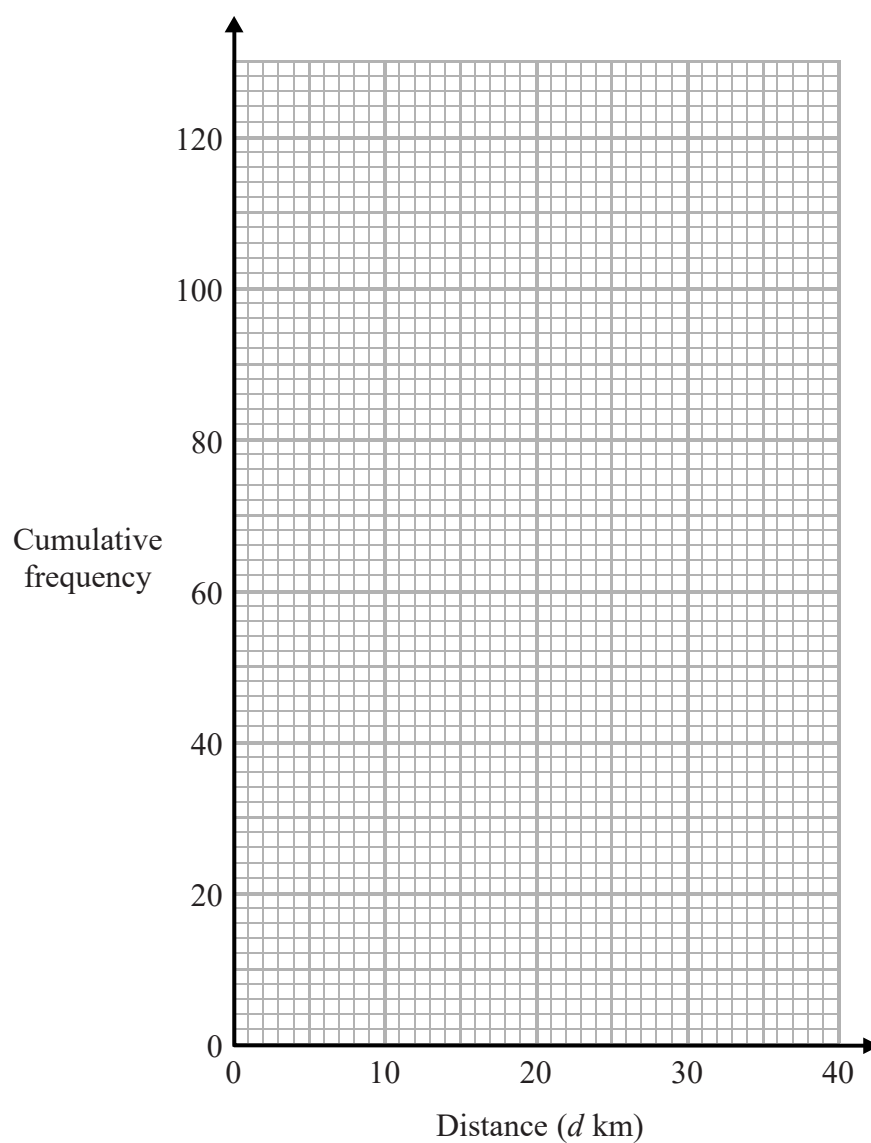
- (a) Complete the cumulative frequency table.

Distance (d km)	Cumulative frequency
$0 < d \leq 5$	
$0 < d \leq 10$	
$0 < d \leq 15$	
$0 < d \leq 20$	
$0 < d \leq 25$	
$0 < d \leq 30$	
$0 < d \leq 35$	

(1)



(b) On the grid, draw a cumulative frequency graph for your table.



(2)

(c) Use your graph to find an estimate for the interquartile range of the distances travelled.

(2)

km

(Total for Question 14 is 5 marks)



P 5 5 6 4 2 A 0 1 3 2 4

15 (a) Simplify $g^8 \div g^2$

(1)

(b) Simplify $6e^2m^7 \times 3em^4$

(2)

(c) Simplify $(64a^6c^2)^{\frac{1}{2}}$

(2)

(d) Factorise $x^2 - 1$

(1)

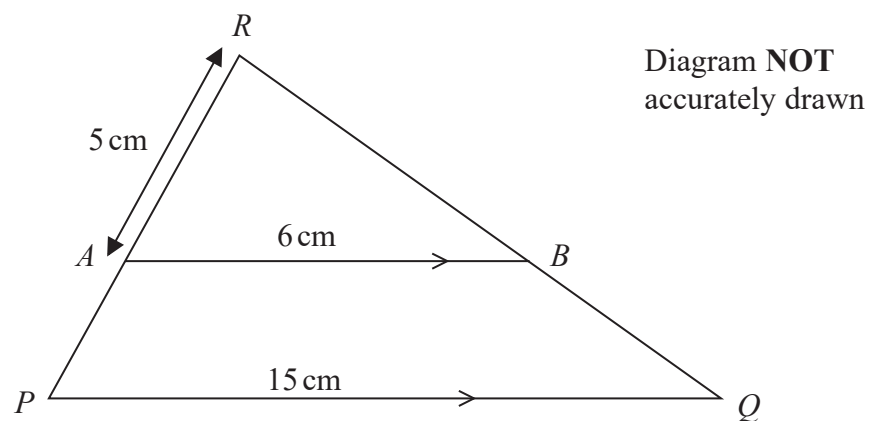
(e) Make k the subject of $f = \sqrt{\frac{1-2k}{3}}$

(3)

(Total for Question 15 is 9 marks)



16 The diagram shows triangle PQR .



A is a point on PR and B is a point on QR so that AB is parallel to PQ .

$$AR = 5 \text{ cm}$$

$$AB = 6 \text{ cm}$$

$$PQ = 15 \text{ cm}$$

(a) Work out the length of AP .

(3) cm

Given that the area of triangle PQR is 88 cm^2

(b) work out the area of triangle ARB .

(2) cm^2

(Total for Question 16 is 5 marks)



P 5 5 6 4 2 A 0 1 5 2 4

17 Use algebra to show that the recurring decimal $0.0\dot{2}\dot{4} = \frac{4}{165}$

(Total for Question 17 is 2 marks)

18 $\mathbf{a} = \begin{pmatrix} -5 \\ 6 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$ $\mathbf{c} = \begin{pmatrix} 4 \\ -2 \end{pmatrix}$

(a) Write $2\mathbf{b} - \mathbf{c}$ as a column vector.

(2)

Cho says that the vector $\mathbf{a} - \mathbf{b}$ is parallel to the vector $\mathbf{c}$

(b) Is Cho correct?

Give a reason for your answer.

(2)

(Total for Question 18 is 4 marks)



- 19 (a) Express $\frac{1}{2x+1} - \frac{3}{x+5}$ as a single fraction.

Give your answer as simply as possible.

(3)

- (b) Solve the inequality $6(x-1)^2 > 24$
Show clear algebraic working.

(4)

(Total for Question 19 is 7 marks)



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20

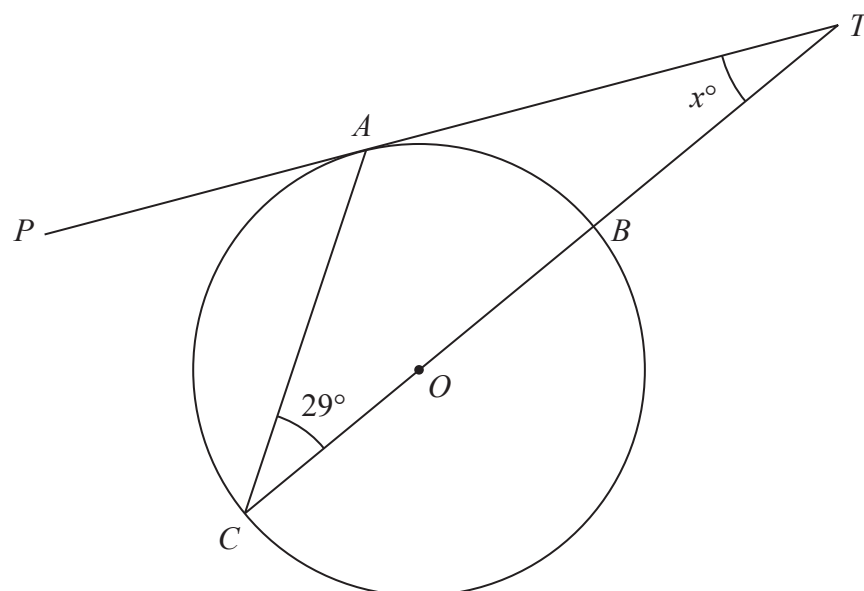


Diagram **NOT**
accurately drawn

A , B and C are points on a circle, centre O .
 TAP is a tangent to the circle.
 $TBOC$ is a straight line.

Angle $ACT = 29^\circ$

Work out the value of x .
 Give a reason for each stage in your working.

$x =$

(Total for Question 20 is 4 marks)

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21 The functions f and g are such that

$$f(x) = \frac{1}{2}x + 3$$

$$g(x) = \frac{14}{2x - 3}$$

(a) Work out $f(3)$

(1)

(b) State the value of x that cannot be included in any domain of g .

(1)

(c) Solve $f^{-1}(x) = gf(x)$
Show clear algebraic working.

(6)

(Total for Question 21 is 8 marks)



22 The diagram shows a parallelogram $LMNP$.

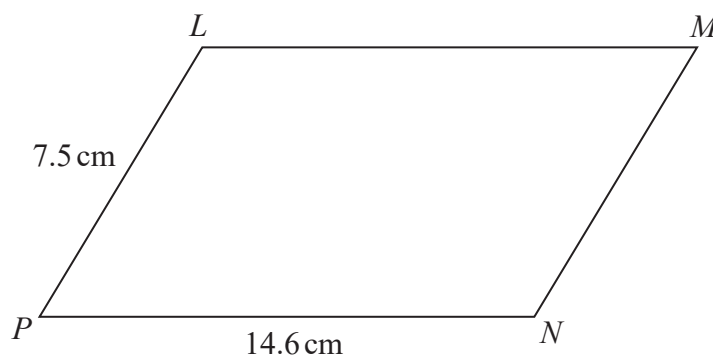


Diagram **NOT**
accurately drawn

$$LN = 13.3 \text{ cm}$$

Calculate the area of the parallelogram.

Give your answer correct to 3 significant figures.

cm^2

(Total for Question 22 is 4 marks)



23 $M = \frac{b - c}{a}$

$a = 5.3$ correct to 1 decimal place.

$b = 346.6$ correct to 1 decimal place.

$c = 80.0$ correct to 1 decimal place.

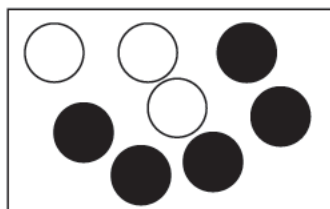
Calculate the upper bound for the value of M .

Show your working clearly.

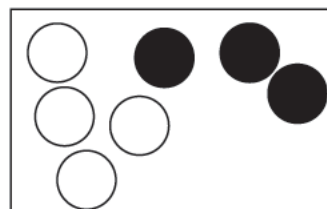
(Total for Question 23 is 3 marks)



- 24 There are only 3 white and 5 black counters in box X.
There are only 4 white and 3 black counters in box Y.



box X



box Y

Michael takes at random 2 counters from box X and puts both counters into box Y.
He then takes at random 1 counter from box Y and puts this counter into box X.

Work out the probability that there is now an equal number of white counters and black counters in box Y.

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(Total for Question 24 is 4 marks)

TOTAL FOR PAPER IS 100 MARKS



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