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| Please check the examination details below before entering your candidate information   |   |
| Candidate surname   | Other names   |
| Centre Number   | Candidate Number  |
| <div><div></div><div></div><div></div><div></div><div></div></div>  | <div><div></div><div></div><div></div><div></div></div>                             |
| <b>Pearson Edexcel International GCSE</b>   |   |
| Time: 2 hours   | Paper reference <b>4MA1/2H</b>  |
| <b>Mathematics A</b><br><b>PAPER: 2H</b><br><b>Higher Tier</b>  |   |
| Grade 2<br>UEB Braille  |  |
| <b>You must have: Calculator, tactile ruler and protractor, compasses and drawing equipment e.g. geometry board, rubber mat, mapping pins, rubber bands, drawing stylus and spur wheel.</b> | Total Marks   |

**YOU WILL BE GIVEN**

- Separate Diagram Booklet.
- Separate Formulae Booklet.
- Bumpons for Question 13 (b).
- Wikki Stix for Question 2 (a) and Question 13 (b).
- Sticky labels for Question 2 (a) and Question 2 (b).

**Instructions**

- On your paper, write your name, centre number and candidate number.
- Answer **all** questions.
- Without sufficient working, correct answers may be awarded no marks.
- Answer the questions **on your paper**.
- **Calculators may be used.**
- You must **NOT** write anything on the formulae **booklet**.
- Anything you write on the formulae **booklet** 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 ►



**Arithmetic series**

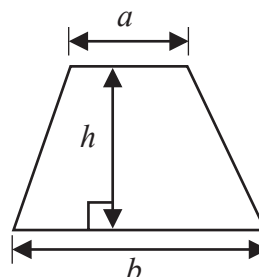
Sum to  $n$  terms,  $S_n = \frac{n}{2} [2a + (n-1)d]$

**The quadratic equation**

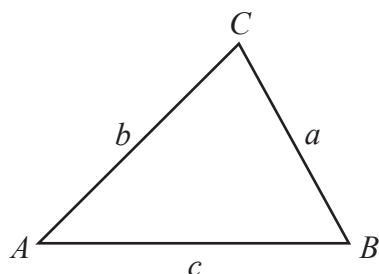
The solutions of  $ax^2 + bx + c = 0$  where  $a \neq 0$  are given by:

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

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



**Trigonometry**



**In any triangle ABC**

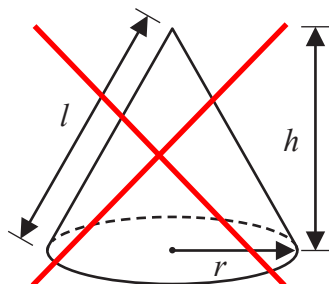
**Sine Rule**  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

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

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

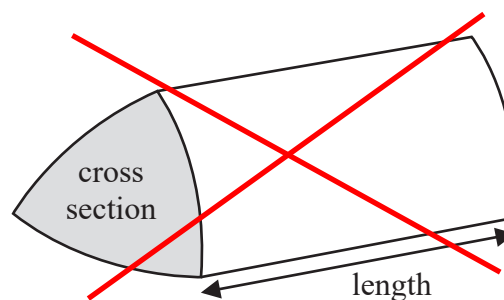
**Volume of cone**  $= \frac{1}{3}\pi r^2 h$

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



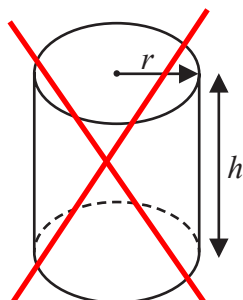
**Volume of prism**

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



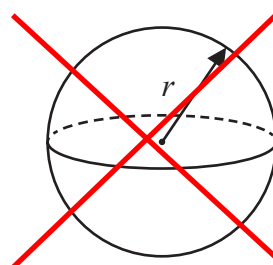
**Volume of cylinder**  $= \pi r^2 h$

**Curved surface area of cylinder**  $= 2\pi r h$



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

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



Answer ALL TWENTY FOUR questions.

Write your answers **on your paper**.

You must write down all the stages in your working.

1. The list below represents some integers where  $w < x < y < z$

**w**      **x**      **y**      **z**      **z**      **z**

The mode of the integers is 9

The median of the integers is 8

The range of the integers is 4

Work out the value of **w**, the value of **x**, the value of **y** and the value of **z**

Ans: **w** = .....

Ans: **x** = .....

Ans: **y** = .....

Ans: **z** = .....

(Total for Question 1 is 3 marks)

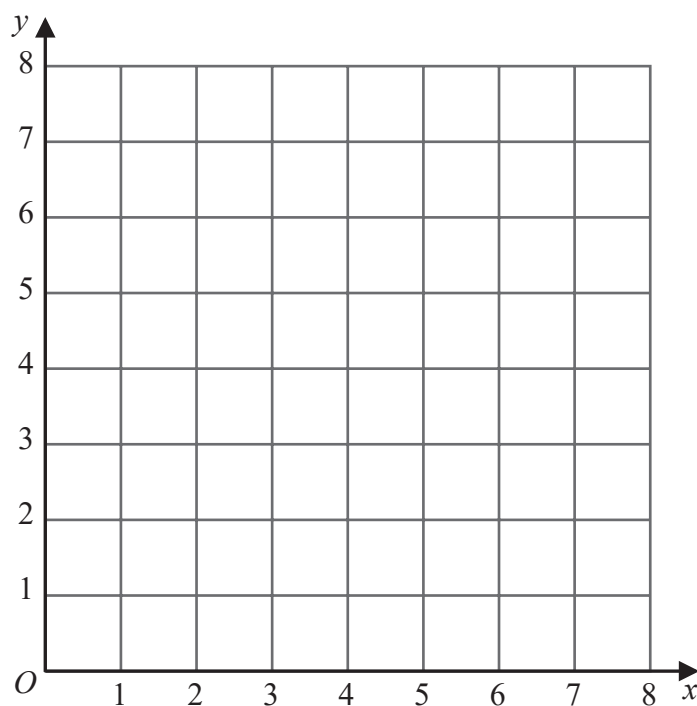


2. Look at the diagram for Question 2 in the separate Diagram Booklet.  
The diagram is a coordinate grid.

(a) On the grid, draw and label with its equation **each of** the **following** straight lines:

(i)  $y = 1$       (ii)  $x = 2$       (iii)  $x + y = 7$

A spare tactile diagram, Wikki Stix and sticky labels are provided for this question.



(3)

(b) Show on the grid, the region that satisfies **all three** of the inequalities **below**.

$y \geq 1$        $x \geq 2$        $x + y \leq 7$

Label the region **R**.

A sticky label, **R**, is provided for this question.

(1)

(Total for Question 2 is 4 marks)



3. An aeroplane travelled from New York City to Los Angeles.

The aeroplane travelled a distance of 3980 kilometres in 5 hours 24 minutes.

Work out the average speed of the aeroplane.

Give your answer in kilometres per hour correct to the nearest whole number.

**Ans:**..... kilometres per hour

(Total for Question 3 is 3 marks)

4. Show that  $5\frac{1}{3} - 2\frac{6}{7} = 2\frac{10}{21}$

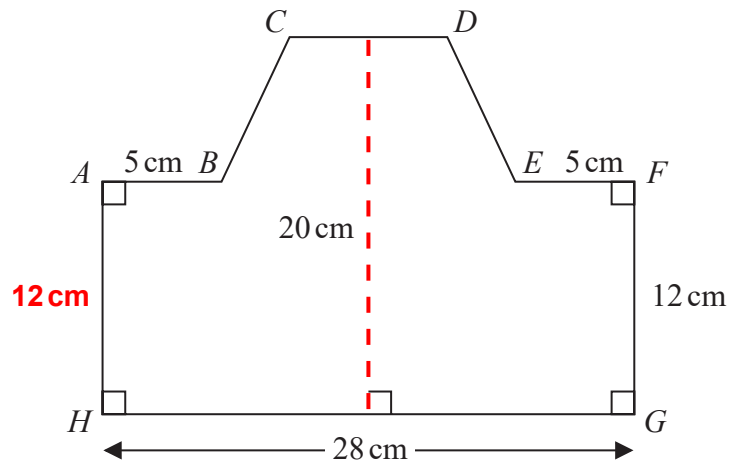
**Ans:**

(Total for Question 4 is 3 marks)



5. Look at the diagram for Question 5 in the separate Diagram Booklet.  
The diagram is NOT accurately drawn.

The diagram shows an 8-sided shape  $ABCDEFGH$ .



**In the diagram:**

$HG = 28 \text{ cm}$      $AH = FG = 12 \text{ cm}$      $AB = EF = 5 \text{ cm}$

The height of the shape is 20 cm

$CD$  is parallel to  $HG$

$AH$  is parallel to  $FG$

All the marked angles are right angles.

The area of shape  $ABCDEFGH$  is  $434 \text{ cm}^2$

Find the length of  $CD$ .

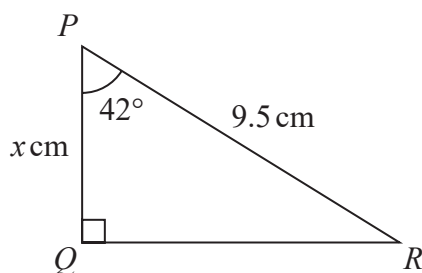
**Ans:** ..... cm

(Total for Question 5 is 4 marks)



6. Look at the diagram for Question 6 in the separate Diagram Booklet.  
The diagram is NOT accurately drawn.

The diagram shows triangle  $PQR$ .



In the diagram:

$PR = 9.5 \text{ cm}$

$PQ = x \text{ cm}$

angle  $QPR = 42^\circ$

angle  $PQR$  is a right angle.

Work out the value of  $x$

Give your answer correct to **two** decimal places.

**Ans:**  $x =$  .....

(Total for Question 6 is 3 marks)

7. Change a speed of 81 kilometres per hour to a speed in metres per second.

**Ans:** ..... metres per second

(Total for Question 7 is 3 marks)



8. Behnaz makes 300 celebration cards so that

number of birthday cards : number of anniversary cards : number of congratulations cards = 7:5:3

$\frac{2}{5}$  of the birthday cards have numbers on them.

36% of the anniversary cards have numbers on them.

None of the congratulations cards have numbers on them.

Work out what fraction of the 300 **celebration** cards have numbers on them.

Give your answer in its simplest form.

**Ans:** .....

(Total for Question 8 is 5 marks)





9. Pasha invests 50,000 dollars in a savings account for 4 years.  
He gets 1.3% per year compound interest.

Work out how much money Pasha will have in his savings account at the end of 4 years.  
Give your answer correct to the nearest dollar.

**Ans:** ..... dollars

(Total for Question 9 is 3 marks)



10. Solve the simultaneous equations

$$7x + 3y = 3$$

$$3x - y = 7$$

Show clear algebraic working.

Ans:  $x =$  .....

Ans:  $y =$  .....

(Total for Question 10 is 3 marks)

11. (i) Factorise  $x^2 + 5x - 24$

Ans: .....

(2)

(ii) Hence, solve  $x^2 + 5x - 24 = 0$

Ans: .....

(1)

(Total for Question 11 is 3 marks)



12. Larry is a delivery man.

He has 7 parcels to deliver.

The mean weight of the 7 parcels is 2.7 kg

Larry delivers 3 of the parcels.

Each of these 3 parcels has a weight of  $W$  kg

The mean weight of the other 4 parcels is 3.3 kg

Work out the value of  $W$

**Ans:**  $W =$  .....

(Total for Question 12 is 3 marks)



13. The table **below** gives information about the ages, in years, of 80 people in a train carriage.

| Age ( <b>n</b> years)     | Frequency |
|---------------------------|-----------|
| $0 < \mathbf{n} \leq 20$  | <b>5</b>  |
| $20 < \mathbf{n} \leq 30$ | <b>20</b> |
| $30 < \mathbf{n} \leq 40$ | <b>30</b> |
| $40 < \mathbf{n} \leq 50$ | <b>15</b> |
| $50 < \mathbf{n} \leq 60$ | <b>5</b>  |
| $60 < \mathbf{n} \leq 70$ | <b>5</b>  |

(a) Complete the cumulative frequency table **below**.

| Age ( <b>n</b> years)    | Cumulative frequency |
|--------------------------|----------------------|
| $0 < \mathbf{n} \leq 20$ | (i)                  |
| $0 < \mathbf{n} \leq 30$ | (ii)                 |
| $0 < \mathbf{n} \leq 40$ | (iii)                |
| $0 < \mathbf{n} \leq 50$ | (iv)                 |
| $0 < \mathbf{n} \leq 60$ | (v)                  |
| $0 < \mathbf{n} \leq 70$ | (vi)                 |

**Ans:** (i) \_\_\_\_ (ii) \_\_\_\_ (iii) \_\_\_\_ (iv) \_\_\_\_ (v) \_\_\_\_ (vi) \_\_\_\_ (1)

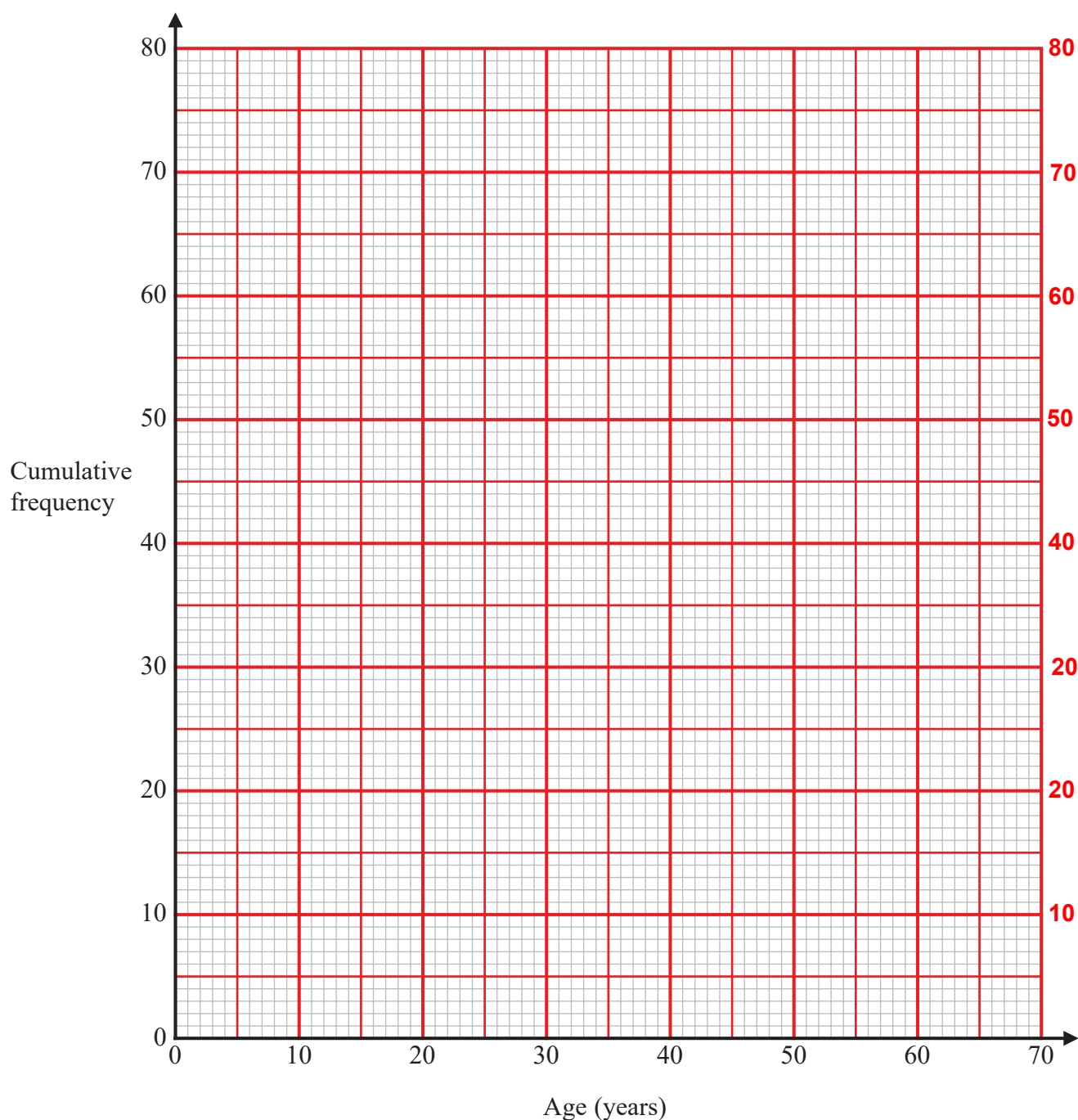
(b) On the grid **provided for Question 13 in the separate Diagram Booklet**, draw a cumulative frequency graph for your table.

**A spare tactile diagram, bumpons and Wikki Stix are available for this question.** (2)

(c) Use your graph to find an estimate for the median age of the 80 people.

**Ans:** ..... years (1)





- (d) Of the people in the train carriage, 60% of those who are aged between **25** and **60** are going to work. None of the other people in the train carriage are going to work.

Use your graph to find an estimate for the number of people in the train carriage who are going to work.

Ans: .....

(3)

(Total for Question 13 is 7 marks)



14. (a) Expand and simplify  $(5 - y)(2y + 3)(y + 4)$   
Show your working clearly.

Ans: .....  
(3)

- (b) Make  $n$  the subject of  $k = \frac{n+3}{4+n} - 7$

Ans: .....  
(4)

(Total for Question 14 is 7 marks)



15. (a) Solve  $\frac{4x+5}{3} - \frac{3-2x}{2} = 13$

Show clear algebraic working.

**Ans:**  $x =$  .....  
(4)

(b) Solve the inequality  $2y^2 - 7y - 30 \leq 0$   
Show your working clearly.

**Ans:** .....  
(3)

(Total for Question 15 is 7 marks)



16. Look at the diagram for Question 16 in the separate Diagram Booklet.

The diagram shows an incomplete Venn diagram.

100 farmers are asked if they have goats (**Set G**), sheep (**Set S**) or chickens (**Set C**) on their farms.

Of these farmers

31 have sheep

53 have chickens

6 have goats, sheep and chickens

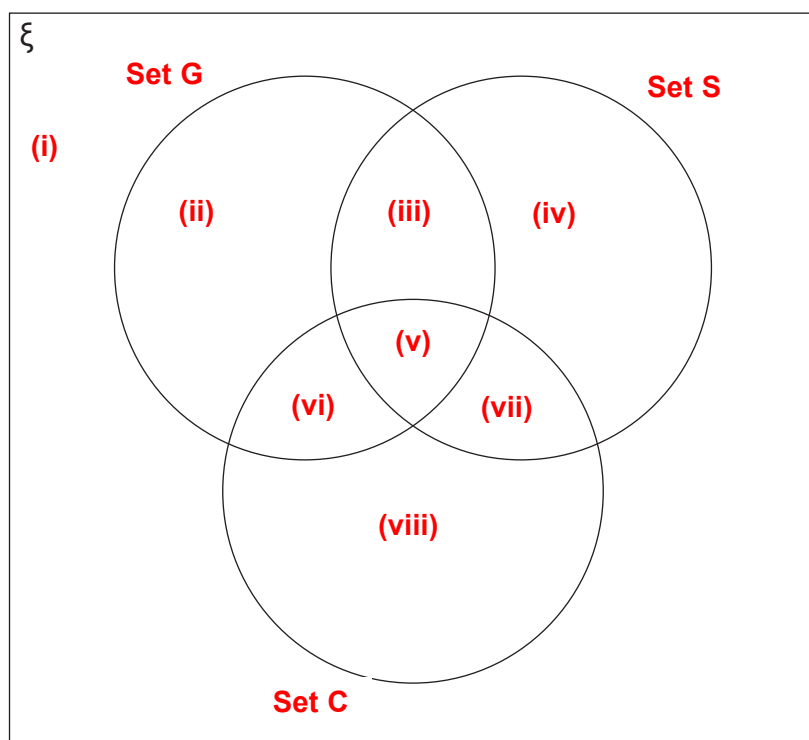
11 have sheep and goats

17 have sheep and chickens

18 have goats and chickens

20 do not have any goats, sheep or chickens

- (a) Using this information, complete the Venn diagram to show the number of farmers in each appropriate subset.



Ans: (i) \_\_\_\_ (ii) \_\_\_\_ (iii) \_\_\_\_ (iv) \_\_\_\_ (v) \_\_\_\_ (vi) \_\_\_\_ (vii) \_\_\_\_ (viii) \_\_\_\_

(3)





(b) Find **the following**:

(i)  $n(G)$

**Ans:** .....  
(1)

(ii)  $n([G \cup S]')$

**Ans:** .....  
(1)

(iii)  $n(G' \cap C)$

**Ans:** .....  
(1)

(c) One of the farmers who has chickens is chosen at random.

Find the probability that this farmer also has goats.

**Ans:** .....  
(2)

(Total for Question 16 is 8 marks)

17.  $M$  varies directly as the cube of  $p$

$M = 4$  when  $p = 0.5$

Find the value of  $p$  when  $M = 500$

**Ans:** .....

(Total for Question 17 is 4 marks)



**18. Given that**

$$X = \frac{2p - q}{t}$$

**p** = 7.5 correct to 1 decimal place.

**q** = 3.42 correct to 2 decimal places.

**t** = 2 correct to the nearest whole number.

Work out the upper bound of the value of  $X$   
Show your working clearly.

**Ans:** .....

(Total for Question 18 is 3 marks)



**19. Given that**

$$n = \frac{14}{3x-7} \quad x = \frac{7}{4y-3}$$

Express  $n$  in the form  $\frac{py+q}{ry+s}$  where  $p, q, r$  and  $s$  are integers.

Give your answer in its simplest form.

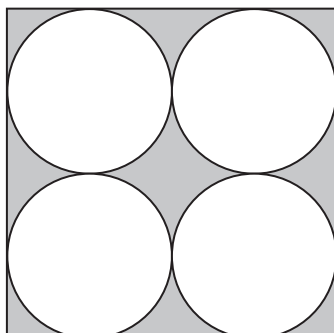
**Ans:  $n$**  = .....

(Total for Question 19 is 3 marks)



20. Look at the diagram for Question 20 in the separate Diagram Booklet.  
The diagram is NOT accurately drawn.

The diagram shows four identical circles drawn inside a square.



In the diagram, each circle touches two other circles and two sides of the square.

The region inside the square that is outside the circles, shown shaded in the diagram, has a total area of  $40 \text{ cm}^2$

Work out the perimeter of the square.

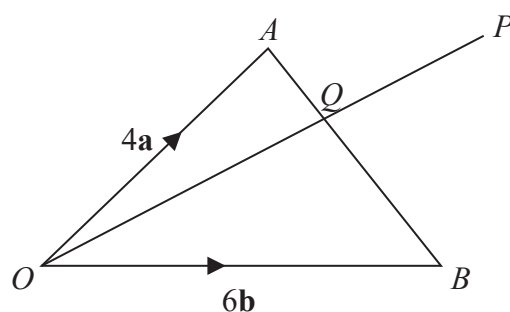
Give your answer correct to 3 significant figures.

Ans: ..... cm

(Total for Question 20 is 4 marks)



21. Look at the diagram for Question 21 in the separate Diagram Booklet.  
The diagram is NOT accurately drawn.  
The diagram shows a triangle  $OAB$ .



**In the diagram:**

$Q$  is the point on  $AB$  such that  $OQP$  is a straight line.

$$\vec{OA} = 4\mathbf{a} \quad \vec{OB} = 6\mathbf{b} \quad \vec{AP} = 2\mathbf{a} + 8\mathbf{b}$$

Using a vector method, find the ratio  $AQ:QB$

**Ans:**  $AQ:QB = \dots\dots\dots$

(Total for Question 21 is 5 marks)



22.  $ABCD$  is a kite, with diagonals  $AC$  and  $BD$ , drawn on a centimetre square grid, with a scale of 1 cm for 1 unit on each axis.

$A$  is the point with coordinates  $(-3, 4)$

The diagonals of the kite intersect at the point  $M$  with coordinates  $(0, 2)$

Given that  $AB = AD = 6.5$  cm and the  $x$  coordinate of  $B$  is positive,

find the coordinates of the points  $B$  and  $D$ .



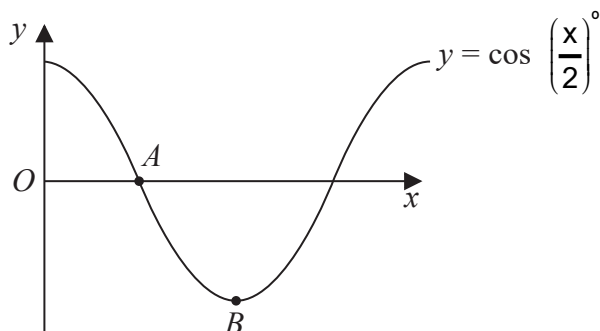
Ans: point B (..... , .....)

Ans: point D (..... , .....)

(Total for Question 22 is 7 marks)

**23. Look at the diagram for Question 23 in the separate Diagram Booklet.**

The diagram shows a sketch of the graph of  $y = \cos \left( \frac{x}{2} \right)^\circ$



(i) Find the coordinates of the point A

Ans: point A (..... , .....)  
(1)

(ii) Find the coordinates of the point B

Ans: point B (..... , .....)  
(1)

(Total for Question 23 is 2 marks)



24. Given that

$$\frac{18 \times (\sqrt{27})^{4n+6}}{6 \times 9^{2n+8}} = 3^x$$

express  $x$  in terms of  $n$

Show your working clearly and simplify your expression.

**Ans:**  $x =$  .....

(Total for Question 24 is 3 marks)

TOTAL FOR PAPER IS 100 MARKS

**END OF PAPER**

