

|                                      |               |                  |
|--------------------------------------|---------------|------------------|
| Surname <i>StemUp Model Solution</i> | Centre Number | Candidate Number |
| First name(s)                        |               | 0                |



**GCSE**

3300U10-1



A20-3300U10-1

**MONDAY, 9 NOVEMBER 2020 – MORNING**

**MATHEMATICS**  
**UNIT 1: NON-CALCULATOR**  
**FOUNDATION TIER**

1 hour 30 minutes

**ADDITIONAL MATERIALS**

The use of a calculator is not permitted in this examination.  
A ruler, protractor and a pair of compasses may be required.

**INSTRUCTIONS TO CANDIDATES**

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

If you run out of space, use the additional page at the back of the booklet. Question numbers must be given for all work written on the additional page.

Take  $\pi$  as 3.14.

**INFORMATION FOR CANDIDATES**

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

In question 12, the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

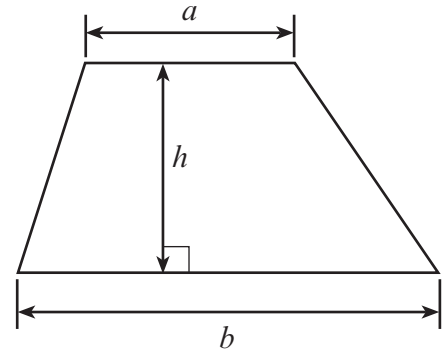
| For Examiner's use only |              |              |
|-------------------------|--------------|--------------|
| Question                | Maximum Mark | Mark Awarded |
| 1.                      | 2            |              |
| 2.                      | 5            |              |
| 3.                      | 2            |              |
| 4.                      | 2            |              |
| 5.                      | 2            |              |
| 6.                      | 2            |              |
| 7.                      | 2            |              |
| 8.                      | 3            |              |
| 9.                      | 5            |              |
| 10.                     | 2            |              |
| 11.                     | 2            |              |
| 12.                     | 5            |              |
| 13.                     | 4            |              |
| 14.                     | 4            |              |
| 15.                     | 5            |              |
| 16.                     | 3            |              |
| 17.                     | 3            |              |
| 18.                     | 4            |              |
| 19.                     | 5            |              |
| 20.                     | 3            |              |
| Total                   | 65           |              |



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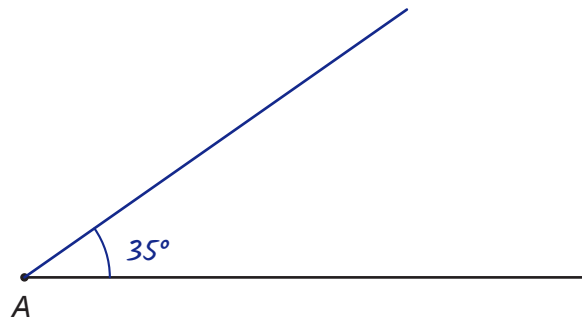
**Formula List – Foundation Tier**

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



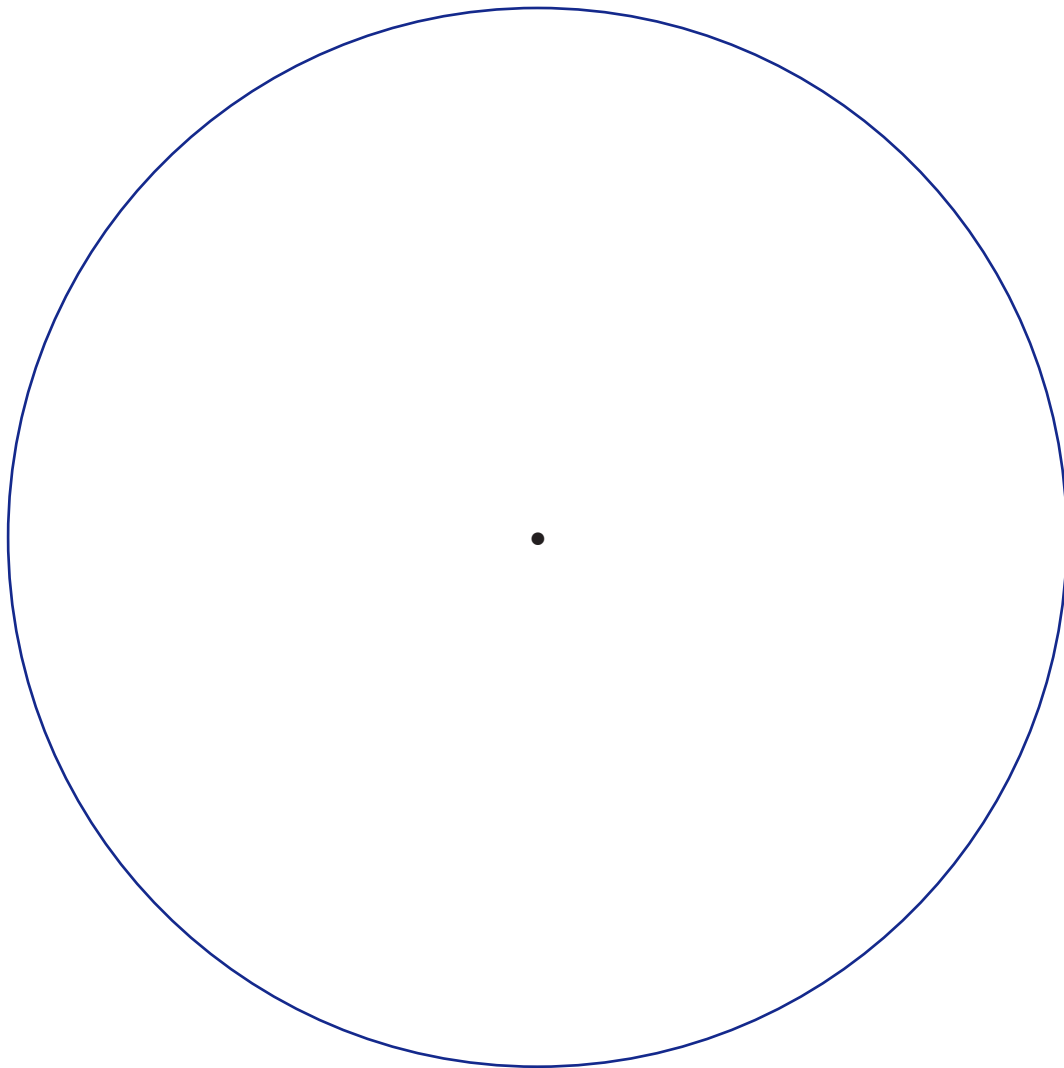
1. (a) Draw an angle of  $35^\circ$  at point A.

[1]



- (b) In the space below, draw a circle with a diameter of 14 cm.  
The centre of the circle is marked • below.

[1]



2. (a) Add 4571 and 862. [1]

4571

+ 862

5433

Answer: 5433

- (b) Subtract 643 from 817. [1]

<sup>71</sup>  
817

- 643

174

Answer: 174

- (c) Calculate one quarter of 300. [1]

$$300 \div 4 = 75$$

- (d) Gwilym thinks of a number.  
When he divides his number by 7, he gets an answer of 6.

When he divides his number by 2, what should his answer be? [2]

$$\text{Gwilym's number} = 6 \times 7 = 42$$

$$42 \div 2 = 21$$

His answer should be 21

3. (a) Write 637 correct to the nearest 100. [1]

600

- (b) Write 3892 correct to the nearest thousand. [1]

4000



4. (a) One of these letters has exactly one line of symmetry.  
Circle this letter.

[1]

P H Z D O

- (b) One of these letters has rotational symmetry of order 2.  
Circle this letter.

[1]

V T S L M

5. (a) Write a number in the empty box to make the calculation correct.

[1]

$$20 - \boxed{9} + 6 = 17$$

$20 - 9 = 11, 11 + 6 = 17$

- (b) Put  $+$ ,  $-$ ,  $\times$  or  $\div$  in each space below to make the calculation correct.

[1]

$$18 \div 6 - 2 = 1$$

$18 \div 6 = 3, 3 - 2 = 1$



6. Write down the next number in each of the following sequences.

(a) 29, 35, 41, 47, 53.....

[1]

*+6 each time:  $47 + 6 = 53$*

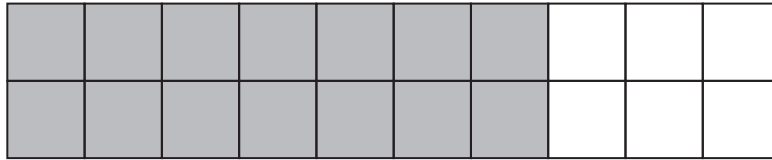
(b) 2000, 1000, 500, 250, 125.....

[1]

*$\div 2$  each time:  $250 \div 2 = 125$*

7. (a) What **percentage** of this diagram has been shaded?

[1]



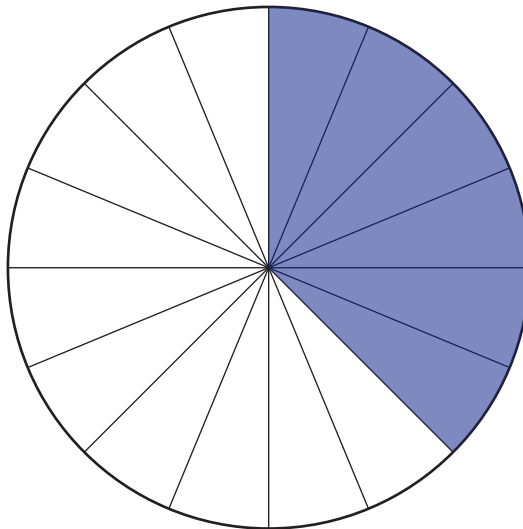
*14 out of 20 squares shaded*

*$14/20 = 70/100 = 70\%$*

*70 %*

(b) Shade  $\frac{3}{8}$  of this diagram.

[1]



*$3/8 = 6/16$ , so shade 6 of the 16 equal sectors*



8. C is a point on the straight line AB.

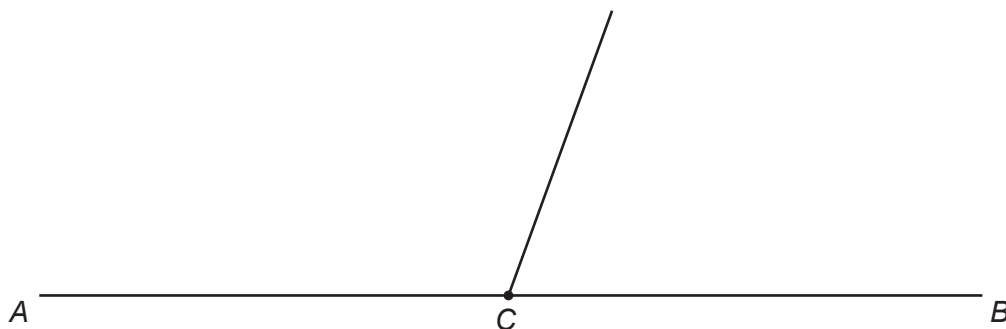


Diagram not drawn to scale

The straight line drawn at C makes two different angles above the line AB.  
One angle is twice the size of the other angle.

Calculate the size of each of the two angles.

[3]

*Let the smaller angle be  $x$ , so the larger angle is  $2x$ .*

*Angles on a straight line add up to  $180^\circ$ .*

$$x + 2x = 180$$

$$3x = 180$$

$$x = 180 \div 3 = 60^\circ$$

$$2x = 2 \times 60 = 120^\circ$$

The two angles are 60  $^\circ$  and 120  $^\circ$



9. (a) Simplify the expression  $9g - 5g + 12g$ . [1]

$$9g - 5g = 4g, \quad 4g + 12g = 16g$$

$$16g$$

- (b) Solve the equation  $5y = 45$ . [1]

$$y = 45 \div 5$$

$$y = 9$$

- (c) Solve the equation  $w - 16 = 14$ . [1]

$$w = 14 + 16$$

$$w = 30$$

- (d) Solve the equation  $4x + 7 = 10$ . [2]

$$4x = 10 - 7$$

$$4x = 3$$

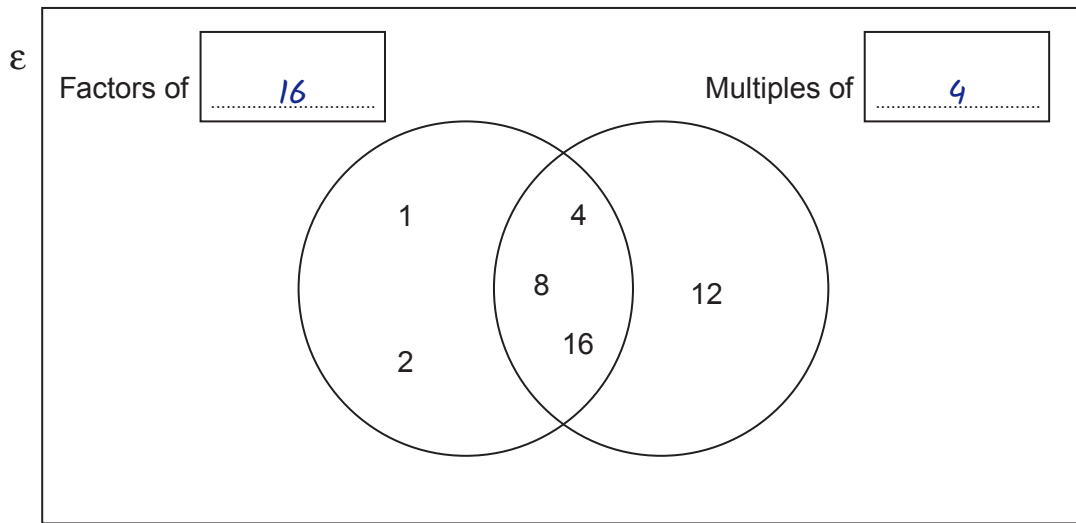
$$x = 3 \div 4$$

$$x = 3/4 \quad (= 0.75)$$



10. Write a number in each box to describe the sets in this Venn diagram.

[2]



Space for working:

*1, 2, 4, 8, 16 are all factors of 16*

*4, 8, 12, 16 are all multiples of 4*

11. Write down three **different whole numbers** so that:

- the median of the three numbers is 13,
- the range of the three numbers is 5.

[2]

*Median 13, so the middle number is 13*

*Range 5, so largest - smallest = 5*

*10, 13, 15:  $15 - 10 = 5$*

The three numbers are

10

,

13

and

15

.



12. In this question, you will be assessed on the quality of your organisation, communication and accuracy in writing.

A rectangle is 7 cm long and 3 cm wide.

Jo puts four of these rectangles on a table.

They are joined together by the **short** sides of the rectangles to make one long rectangle.

What is the perimeter of the long rectangle that Jo has made?

You must draw a diagram of Jo's long rectangle and show all your working.

[3 + 2 OCW]

*Each rectangle is 7 cm long and 3 cm wide.*

*Joining four rectangles by their short (3 cm) sides gives*

*one long rectangle, as shown in my diagram below.*

*Length of long rectangle =  $4 \times 7 = 28$  cm*

*Width of long rectangle = 3 cm*

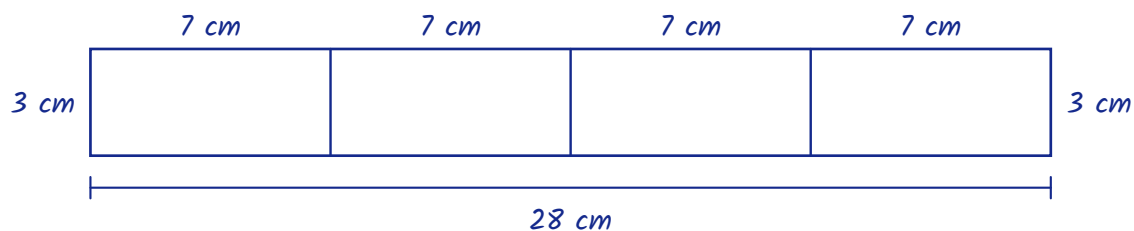
*Perimeter =  $28 + 3 + 28 + 3$*

*$= 8 \times 7 + 2 \times 3$*

*$= 56 + 6$*

*$= 62$  cm*

*So the perimeter of Jo's long rectangle is 62 cm.*



13. (a) What is the time 8 hours and 40 minutes after 11:38? [1]

$$11:38 + 8 \text{ hours} = 19:38$$

$$19:38 + 40 \text{ minutes} = 20:18$$

Time is 20:18

- (b) What is the time difference between 7:35 a.m. and 2:15 p.m. on the same day?  
Give your answer in hours and minutes. [1]

$$7:35 \text{ a.m. to } 8:00 \text{ a.m.} = 25 \text{ minutes}$$

$$8:00 \text{ a.m. to } 2:00 \text{ p.m.} = 6 \text{ hours}$$

$$2:00 \text{ p.m. to } 2:15 \text{ p.m.} = 15 \text{ minutes}$$

$$\text{Total} = 6 \text{ hours } 40 \text{ minutes}$$

Time difference is 6 hours and 40 minutes.

- (c) Evaluate the time difference between 7 minutes 15 seconds and 2 minutes 50 seconds.  
Give your answer in seconds. [2]

$$7 \text{ min } 15 \text{ s} = 7 \times 60 + 15 = 435 \text{ seconds}$$

$$2 \text{ min } 50 \text{ s} = 2 \times 60 + 50 = 170 \text{ seconds}$$

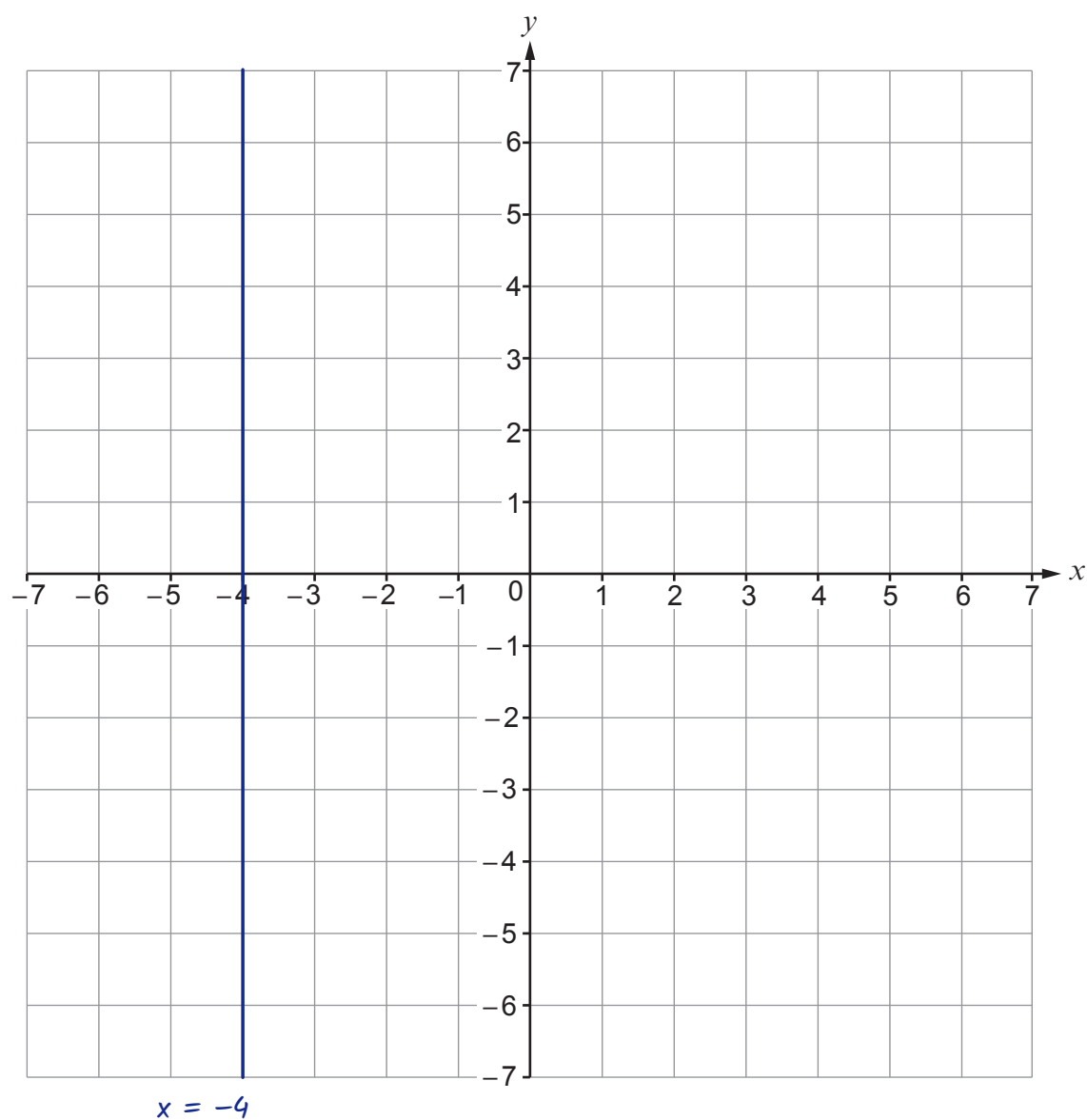
$$435 - 170 = 265 \text{ seconds}$$

Time difference is 265 seconds.



[1]

14. (a) Draw the line  $x = -4$  on the grid below.

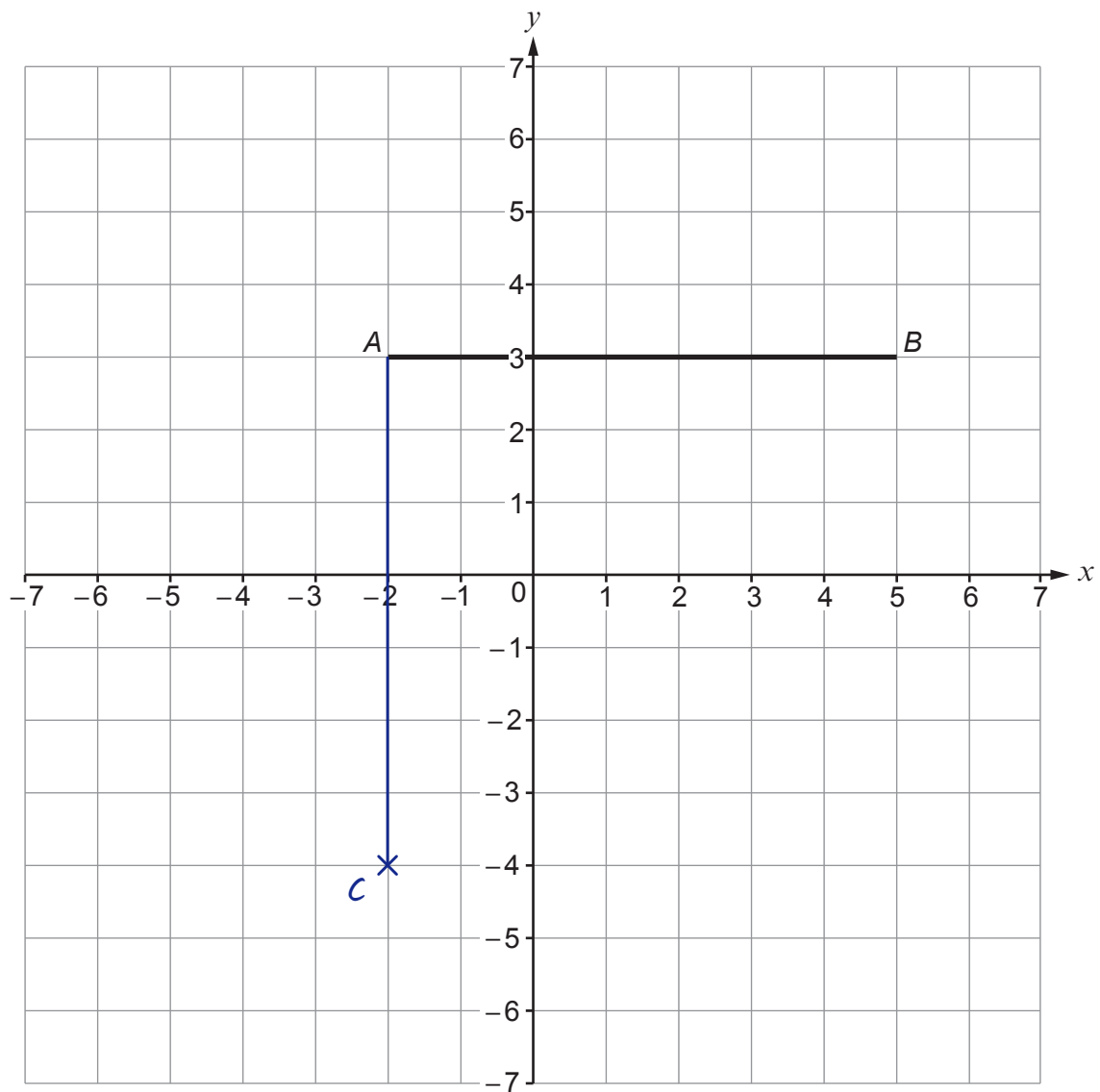


(b) C is a point on the grid below so that:

- $\hat{BAC} = 90^\circ$ ,
- $AC = AB$ .

(i) Show the position of point C on the grid.

[2]



(ii) Write down the coordinates of point C.

[1]

$(-2, -4)$



15. Calculate each of the following.

(a)  $3^3 \times 10^2$

[2]

$$3^3 = 3 \times 3 \times 3 = 27, \quad 10^2 = 100$$

$$27 \times 100 = 2700$$

(b)  $0.4 \times 0.2$

[1]

$$4 \times 2 = 8, \text{ two decimal places}$$

$$0.4 \times 0.2 = 0.08$$

(c)  $\frac{4}{9} + \frac{5}{18}$

[2]

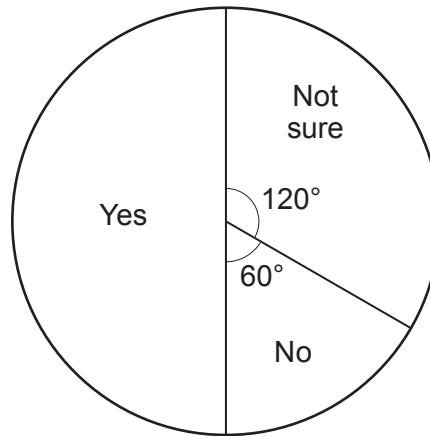
$$\frac{4}{9} + \frac{5}{18} = \frac{8}{18} + \frac{5}{18} = \frac{13}{18}$$

(common denominator 18)



16. 300 students were asked if they would like to change their school's dinner menu.

The pie chart below shows how they answered.



Complete the table below to show the number of students who gave each answer.

[3]

| Answer             | Yes | No | Not sure |
|--------------------|-----|----|----------|
| Number of students | 150 | 50 | 100      |

$$\text{Yes angle} = 360^\circ - 120^\circ - 60^\circ = 180^\circ$$

360° represents 300 students

$$\text{Yes} = 180/360 \times 300 = \frac{1}{2} \times 300 = 150$$

$$\text{No} = 60/360 \times 300 = \frac{1}{6} \times 300 = 50$$

$$\text{Not sure} = 120/360 \times 300 = \frac{1}{3} \times 300 = 100$$

$$\text{Check: } 150 + 50 + 100 = 300$$



17.  $PQ$  and  $RS$  are parallel.

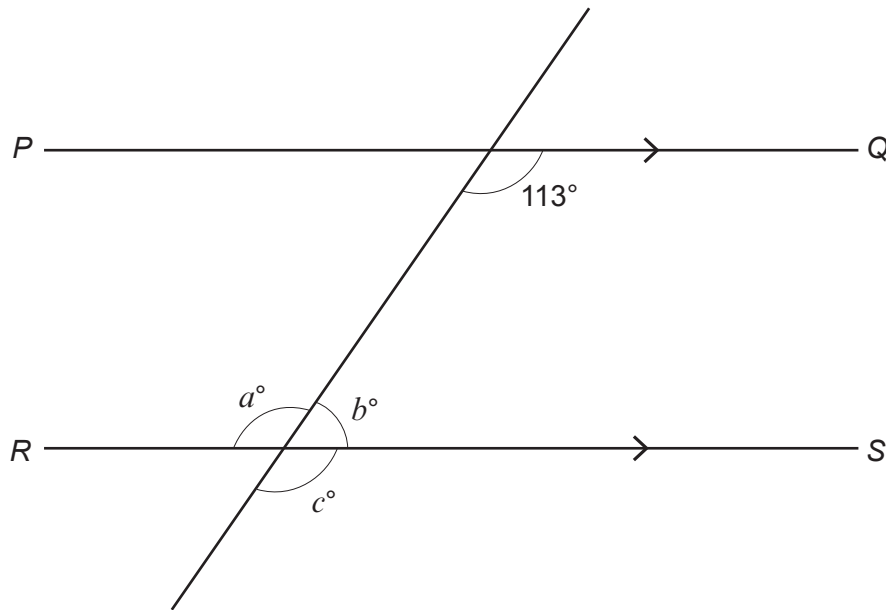


Diagram not drawn to scale

Find the values of  $a$ ,  $b$  and  $c$ .

[3]

$$a = 113^\circ \text{ (alternate angles are equal)}$$

$$b = 180^\circ - 113^\circ = 67^\circ \text{ (angles on a straight line add to } 180^\circ)$$

$$c = 113^\circ \text{ (vertically opposite angles are equal to } a)$$

$$a = 113$$

$$b = 67$$

$$c = 113$$



18. 80 cards are placed in a box.  
Each card shows a picture of one of four islands near the coast of Wales:  
Bardsey Island, Ramsey Island, Skomer Island or Puffin Island.

A card is chosen at random from the box.

The table below gives some of the probabilities that the chosen card shows a picture of a particular island.

| Island      | Bardsey Island<br>(Ynys Enlli) | Ramsey Island<br>(Ynys Dewi) | Skomer Island<br>(Ynys Sgomer) | Puffin Island<br>(Ynys Seiriol) |
|-------------|--------------------------------|------------------------------|--------------------------------|---------------------------------|
| Probability | 0.4                            | 0.15                         | 0.25                           | 0.2                             |

How many of the 80 cards show a picture of Puffin Island?  
You must show all your working.

[4]

*Probabilities add up to 1:*

$$P(\text{Puffin Island}) = 1 - (0.4 + 0.15 + 0.25)$$

$$= 1 - 0.8$$

$$= 0.2$$

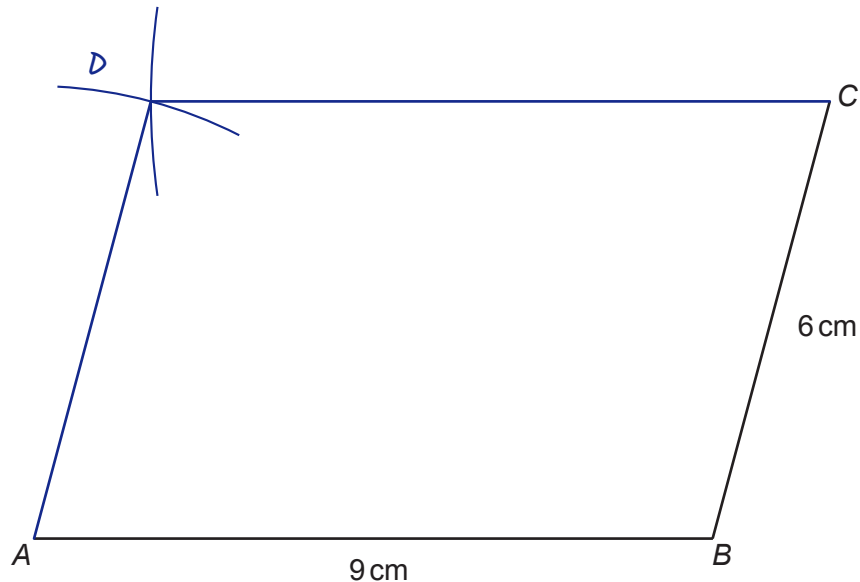
$$\text{Number of Puffin Island cards} = 0.2 \times 80$$

$$= 16$$

*16 cards show a picture of Puffin Island.*

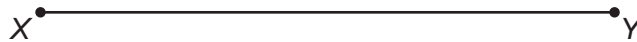


19. (a) Two sides of a parallelogram  $ABCD$  are drawn accurately below. Using only a ruler and a pair of compasses, complete an accurate drawing of the parallelogram. You must show all your construction arcs. [2]



- (b) The line  $XY$  below forms part of a scale drawing of a garden. The scale drawing has a scale of 1:200.

What is the actual distance between point  $X$  and point  $Y$  in the garden? Give your answer in **metres**. [3]



*XY measures 7.6 cm on the drawing*

*Actual =  $7.6 \times 200 = 1520$  cm*

*$1520 \text{ cm} \div 100 = 15.2 \text{ m}$*

Actual distance between point  $X$  and point  $Y$  = 15.2 metres



20. You are given that  $543 \times 17 = 9231$ .

- (a) What is the value of  $5.43 \times 1.7$ ?  
Circle the correct answer.

[1]

0.9231      9.231      92.31      923.1      9231

$$5.43 = 543 \div 100 \text{ and } 1.7 = 17 \div 10, \text{ so } 9231 \div 1000 = 9.231$$

- (b) What is the value of  $\frac{9231}{54.3}$ ?  
Circle the correct answer.

[1]

0.17      1.7      17      170      1700

$$54.3 = 543 \div 10, \text{ so } 9231 \div 54.3 = 17 \times 10 = 170$$

- (c) What is the value of  $\frac{9231}{543 \times 1.7}$ ?  
Circle the correct answer.

[1]

0.1      1      10      100      1000

$$543 \times 1.7 = 9231 \div 10 = 923.1, \text{ so } 9231 \div 923.1 = 10$$

**END OF PAPER**



[illegible]