Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
November 2025

Mathematics

StemUp Model Solution

Unit M1
(With calculator)

Foundation Tier



[GMC11]

GMC11

TUESDAY 18 NOVEMBER, 9.15am–11.00am

TIME

1 hour 45 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
You must answer the questions in the spaces provided.
Do not write outside the boxed area on each page or on blank pages.
Complete in black ink only. **Do not write with a gel pen.**
Questions which require drawing or sketching should be completed using an HB pencil.
All working **must** be clearly shown in the spaces provided. Marks may be awarded for partially correct solutions.
You **may** use a calculator for this paper.
Answer **all thirty-two** questions.

INFORMATION FOR CANDIDATES

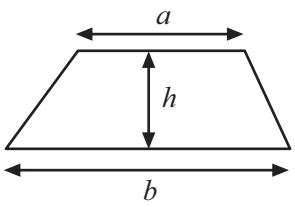
The total mark for this paper is 100.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a calculator, ruler, compasses and a protractor.
The Formula Sheet is on page 2.

[Turn over

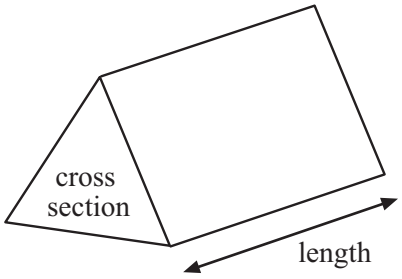
15152

Formula Sheet

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



Volume of prism = area of cross section × length



1 The prices for dental work are shown in the table below.

DENTAL WORK	PRICE
Examination	£35
Scale and polish	£20
Silver filling	£25
White filling	£45
X-ray	£12

(a) Work out the total price for

1 Examination
2 X-rays
2 White fillings

35 + 2 × 12 + 2 × 45
= 35 + 24 + 90
= 149

Answer £ 149 [2]

(b) Paige had three Silver fillings.

She paid with four £20 notes.

How much change should she have received?

3 × 25 = 75
80 − 75 = 5

Answer £ 5 [2]

[Turn over

2 In a class election, $\frac{1}{4}$ of the pupils voted for Damien.

$\frac{1}{5}$ of the pupils voted for Hilary.

Who received more votes, Damien or Hilary?

Explain your answer clearly.

$\frac{1}{4} = 0.25 = 25\%$ (Damien)

$\frac{1}{5} = 0.2 = 20\%$ (Hilary)

Answer Damien because 25% is more than 20%

Damien got 1/4 = 25% of the votes but Hilary only got 1/5 = 20% [2]

3 Ewan sells mobile phones.

He earns £80 per day.

He **also** earns £16 for each phone that he sells.

On Saturday, he sold 4 phones.

On Sunday, he sold 3 phones.

How much did he earn in total for Saturday and Sunday?

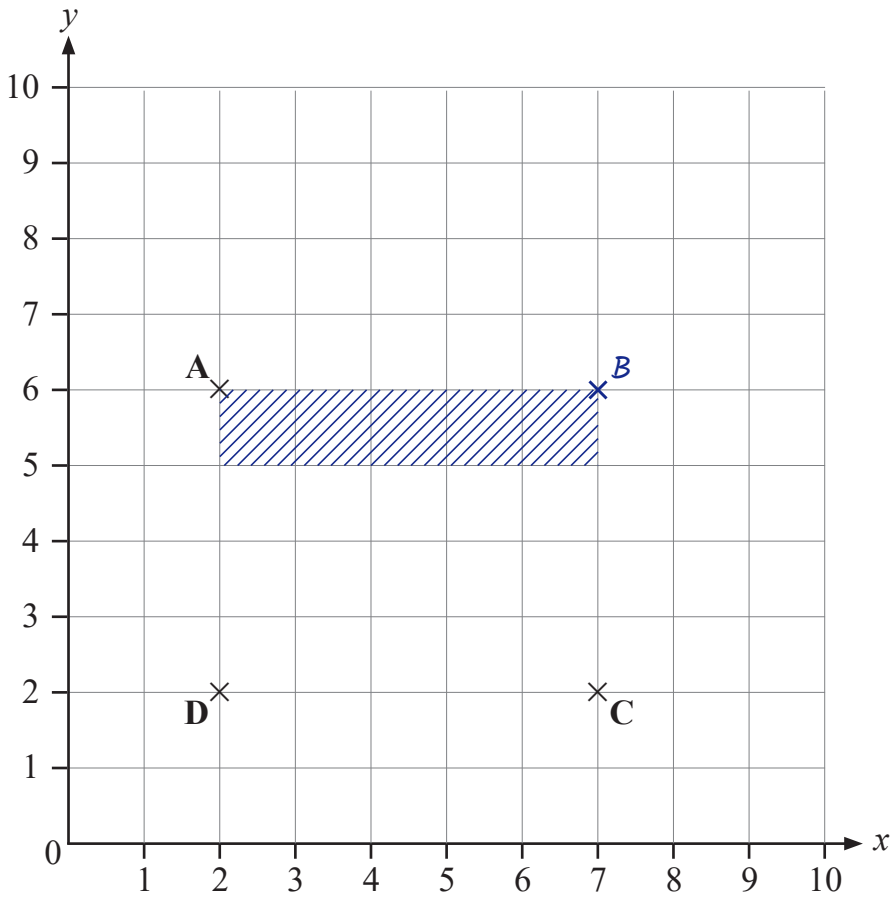
Saturday: $80 + 4 \times 16 = 80 + 64 = 144$

Sunday: $80 + 3 \times 16 = 80 + 48 = 128$

Total = 144 + 128 = 272

Answer £ 272 [4]

4



(a) Write down the coordinates of point **A**.

Answer (2 , 6) [1]

(b) The coordinates of point **B** are (7, 6).

Plot point **B** on the diagram above. [1]

(c) The points can be joined to form a rectangle **ABCD**.

Shade 25% of the rectangle. [1]

[Turn over

5 **(a)** How many minutes are there between 9.35 pm and 10.55 pm?

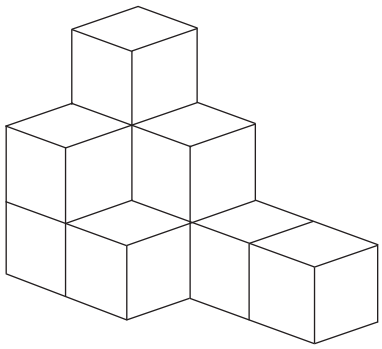
Circle your answer.

20 (80) 100 120

[1]

9.35 pm → 10.35 pm = 60 min
10.35 pm → 10.55 pm = 20 min
60 + 20 = 80 minutes

(b) The shape below is made from centimetre cubes.



What is the volume of the shape?

Answer 10 cm^3 [1]

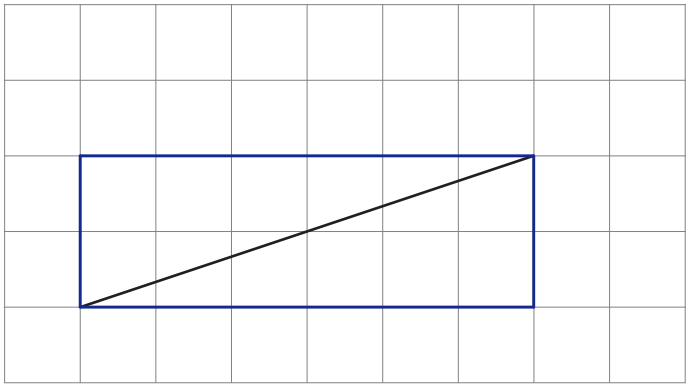
(c) For any circle, which is its shortest length?

Circle your answer.

diameter (radius) circumference

[1]

6 A line is drawn on a centimetre square grid.



(a) Measure the length of the line correct to the nearest millimetre (mm).

Answer 63 mm [1]

The line is a **diagonal** of a rectangle.

(b) (i) Draw the rectangle on the grid. [1]

(ii) What is the area of the rectangle?

Include units with your answer.

Length = 6 cm, width = 2 cm

Area = 6 × 2 = 12 cm^2

Answer 12 cm^2 [2]

[Turn over

7 Peter, Georgia and Eve are each planning a 7-day holiday in Spain.

The options are shown below.

Hotel	Number of stars	Breakfast included	Distance (m) from beach	Outdoor pool	Customer rating	Price (£)
El Dorado	3	Yes	750	Yes	4.2	480
Costa Coral	4	No	150	No	4	550
Villa Luna	2	Yes	1500	Yes	3.5	395
Vista del Sol	5	Yes	500	Yes	4.7	815
Hermosa Playa	3	No	20	No	1.8	370
Paraiso	5	Yes	300	No	4.5	775

(a) Peter wants a hotel with 4 or 5 stars that has an outdoor pool.

Which hotel would be suitable?

Answer *Vista del Sol* [1]

(b) Georgia wants a hotel that includes breakfast, is less than 600 m from the beach and has a customer rating greater than 4

Which is the cheapest hotel that would be suitable?

Answer *Paraiso* [1]

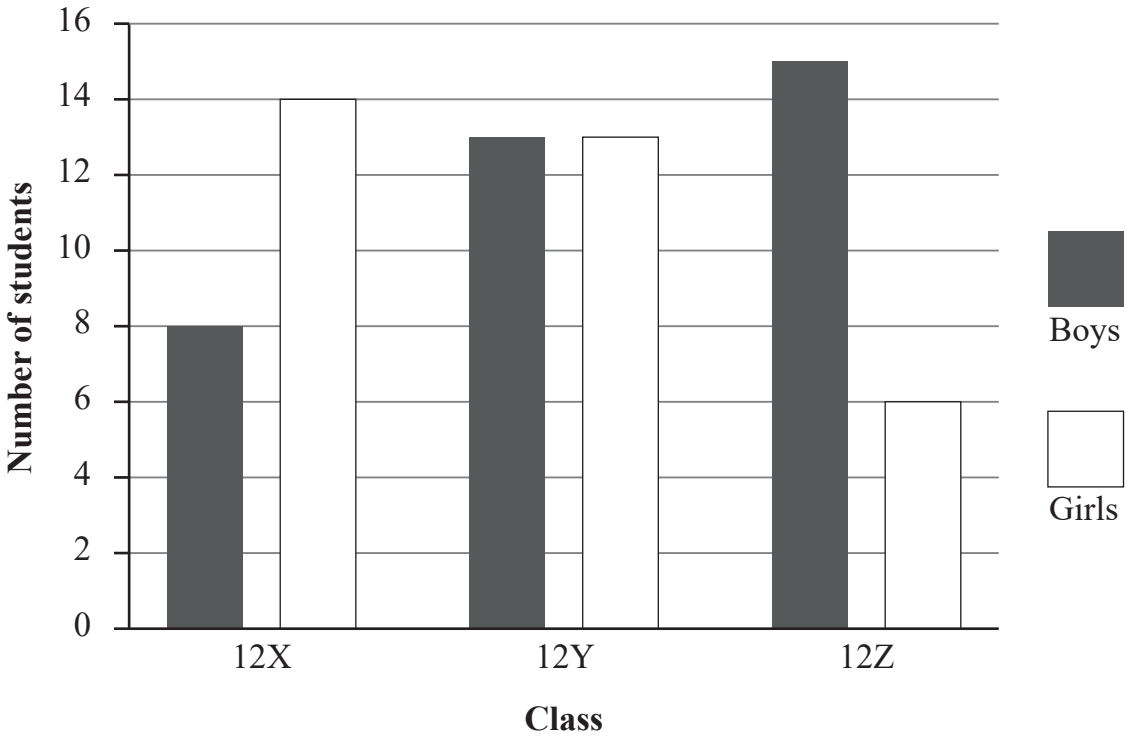
(c) Eve does not want breakfast included.

She chooses Costa Coral rather than Hermosa Playa.

Why might Eve choose the more expensive option?

Answer *Costa Coral has a higher customer rating (4 compared to 1.8)* [1]

8 The dual bar chart shows information about the number of boys and girls in Year 12 classes.



(a) How many girls are in class 12X?

Answer 14 girls [1]

(b) Which class has the fewest students?

Answer 12Z [1]

(c) How many boys are there in total?

8 + 13 + 15 = 36

Answer 36 boys [1]

[Turn over

9 Steve's earnings were £2700 per month.

His pension contribution was 8% of his earnings.

(a) How much was Steve's pension contribution per month?

8% of 2700 = 2700 ÷ 100 × 8
= 27 × 8
= 216

Answer £ 216 [2]

His employer also made a pension contribution of 3% of Steve's earnings.

(b) How much would the **total** pension contributions be each **year**?

Employer: 3% of 2700 = 2700 ÷ 100 × 3 = 81
Total per month = 216 + 81 = 297
Total per year = 297 × 12 = 3564

Answer £ 3564 [2]

10 Minibuses can transport 15 passengers at a time.

There are 110 passengers waiting in a queue.

(a) What is the **minimum** number of minibuses needed to transport everyone in the queue?

110 ÷ 15 = 7.333...
7 minibuses only take 7 × 15 = 105, not enough
so 8 minibuses are needed

Answer 8 [2]

(b) Assuming that all other minibuses were full, how many passengers will be in the last minibus?

15 × 7 = 105, 110 − 105 = 5

Answer 5 [1]

11 Look at these numbers.

2835 **4283**

How much more is the digit **8** worth in 2835 than in 4283?

8 in 2835 is worth 800
8 in 4283 is worth 80
800 − 80 = 720

Answer 720 [2]

[Turn over

12 When ordering posts for a double-sided fence, a joiner uses the rule

"Divide the number of panels by 2 and then add 1"

(a) How many posts are needed for a double-sided fence with 16 panels?

16 ÷ 2 + 1 = 8 + 1 = 9

Answer 9 [1]

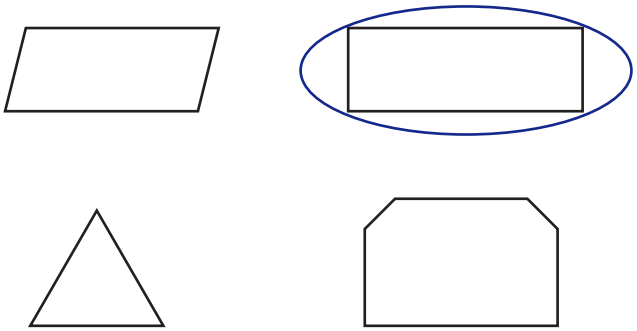
(b) If the joiner ordered 11 posts, how many panels does he need?

Work backwards: subtract 1, then multiply by 2

(11 − 1) × 2 = 10 × 2 = 20

Answer 20 [2]

13 **(a)** Circle the shape that has exactly two lines of symmetry.



[1]

(b) **Calculate** the size of angle q.

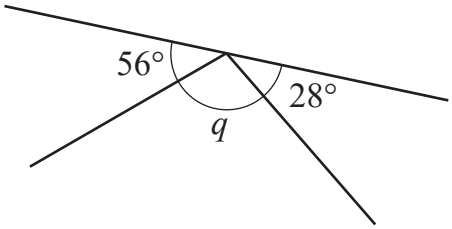
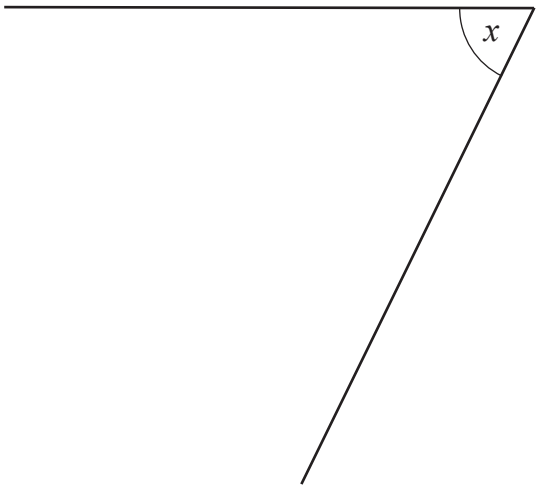


diagram not drawn accurately

Angles on a straight line add to 180°
q = 180 − (56 + 28) = 180 − 84 = 96°

Answer 96 ° [2]

(c) Use a **protractor** to measure the size of angle x.



Answer 64 ° [1]

[Turn over

14 Mary is a chef in a burger bar.

She has 8.3 kg of burger mix.

Mary uses 125 g of burger mix in each burger.

How many burgers can Mary make?

8.3 kg = 8300 g

8300 ÷ 125 = 66.4

so Mary can make 66 whole burgers

Answer 66 [2]

15 The number of visitors to a tourist attraction over a six-year period is given in the table.

Year	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Number of visitors	7910	6920	9430	38 500	34 050	6150

(a) What is the **range** of the number of visitors over the six-year period?

38 500 − 6150 = 32 350

Answer 32 350 visitors [1]

(b) Rick has started calculating the **mean** number of visitors over the six-year period.

Complete Step 2 and write down the mean.

Step 1: 7910 + 6920 + 9430 + 38 500 + 34 050 + 6150 = 102 960

Step 2: 102 960 ÷ 6 = 17 160

Answer The mean is 17 160 visitors [2]

(c) There were 15 000 visitors in 2021

The new mean, over the seven years, is calculated.

Which of the following statements is true?

Circle your answer.

the mean increases **the mean decreases** **the mean stays the same**

[1]

[Turn over

16 The scores of 12 students in a test are

44	31	77	40	16	46
79	68	51	20	50	48

(a) What is the median test score?

In order: 16, 20, 31, 40, 44, 46, 48, 50, 51, 68, 77, 79

Middle two values are 46 and 48

Median = (46 + 48) ÷ 2 = 94 ÷ 2 = 47

Answer *47* [2]

Naomi designs this tally and frequency table to put the scores into groups.

Test score	Tally	Frequency
20–29		
30–39		
40–49		
50–59		
60–69		
70–79		

(b) Write down one criticism of Naomi's tally and frequency table.

Answer *There is no group for 16 (no 10 to 19 group), so the score 16 cannot be put in the table.* [1]

17 Work out the value of $2^3 + 3^2$

$2^3 = 2 \times 2 \times 2 = 8$

$3^2 = 3 \times 3 = 9$

$8 + 9 = 17$

Answer 17 [2]

18 Kasper wants to set a new 4-digit passcode for his phone.

He wants the first 2 digits to be a prime number between 20 and 30

He wants the last 2 digits to be a square number between 20 and 30

Write down both passcodes that he could use.

Primes between 20 and 30: 23, 29

Square number between 20 and 30: 25

Passcodes: 2325 and 2925

Answer 2325 and 2925 [2]

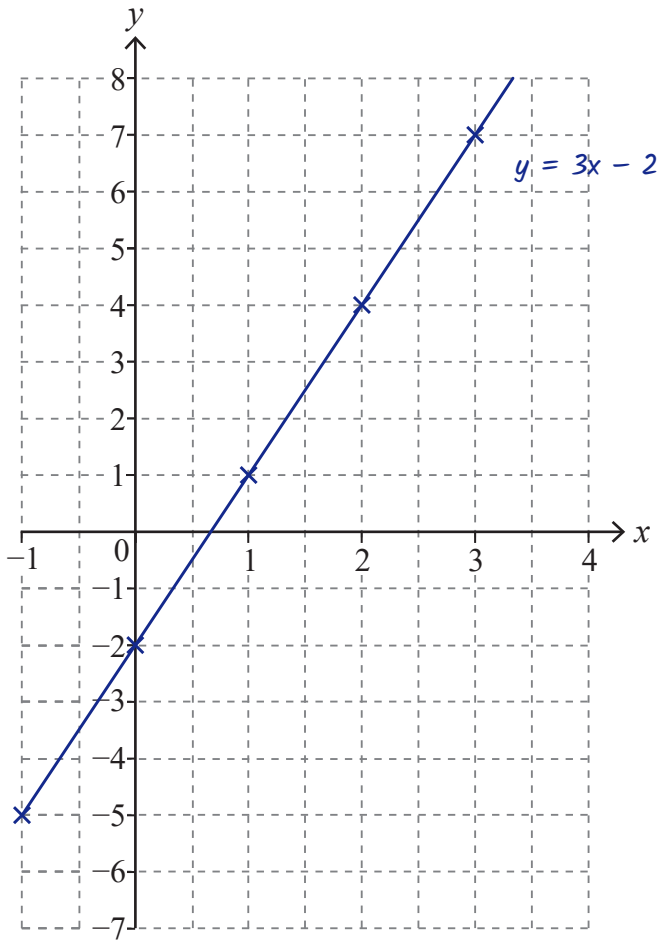
[Turn over

19 (a) (i) Complete the table for $y = 3x - 2$

x	−1	0	1	2	3
y	−5	−2	1	4	7

[1]

(ii) On the grid below, draw the graph of $y = 3x - 2$



[2]

(b) Solve the equation $3x - 2 = 5.5$

$3x - 2 = 5.5$

$3x = 5.5 + 2 = 7.5$

$x = 7.5 \div 3 = 2.5$

Answer $x =$ 2.5 [2]

20 Claire bought 350 bonds at a cost of £4.20 per bond.

Later she bought another 200 bonds, but cannot remember how much she paid per bond.

The total amount she paid for all the bonds was £2500

Calculate how much Claire paid per bond when she bought the 200 bonds.

Show your working out clearly.

First 350 bonds: 350 × 4.20 = £1470

200 bonds cost: 2500 − 1470 = £1030

Price per bond: 1030 ÷ 200 = £5.15

Answer £ 5.15 [4]

[Turn over

21 The six angles in two different triangles are listed in descending order.

The first four angles are 120° 80° 72° 40°

Find the size of the **smallest** angle that would complete the list.

Angles in a triangle add up to 180°

120° must go with 40° (120 + 80 and 120 + 72 are too big)

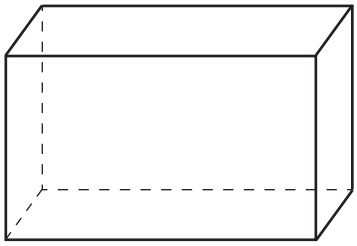
120 + 40 = 160, 180 − 160 = 20°

80 + 72 = 152, 180 − 152 = 28°

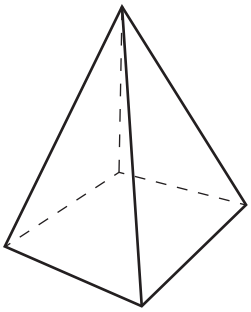
List: 120°, 80°, 72°, 40°, 28°, 20° so the smallest is 20°

Answer *20* ° [3]

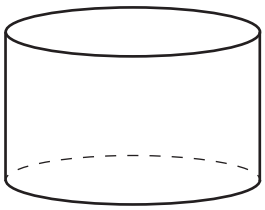
22



Shape A



Shape B



Shape C

(a) What is the mathematical name of Shape A?

Answer Cuboid [1]

(b) Complete the sentences.

(i) Shape B has 8 edges. [1]

(ii) Shape B has 5 vertices. [1]

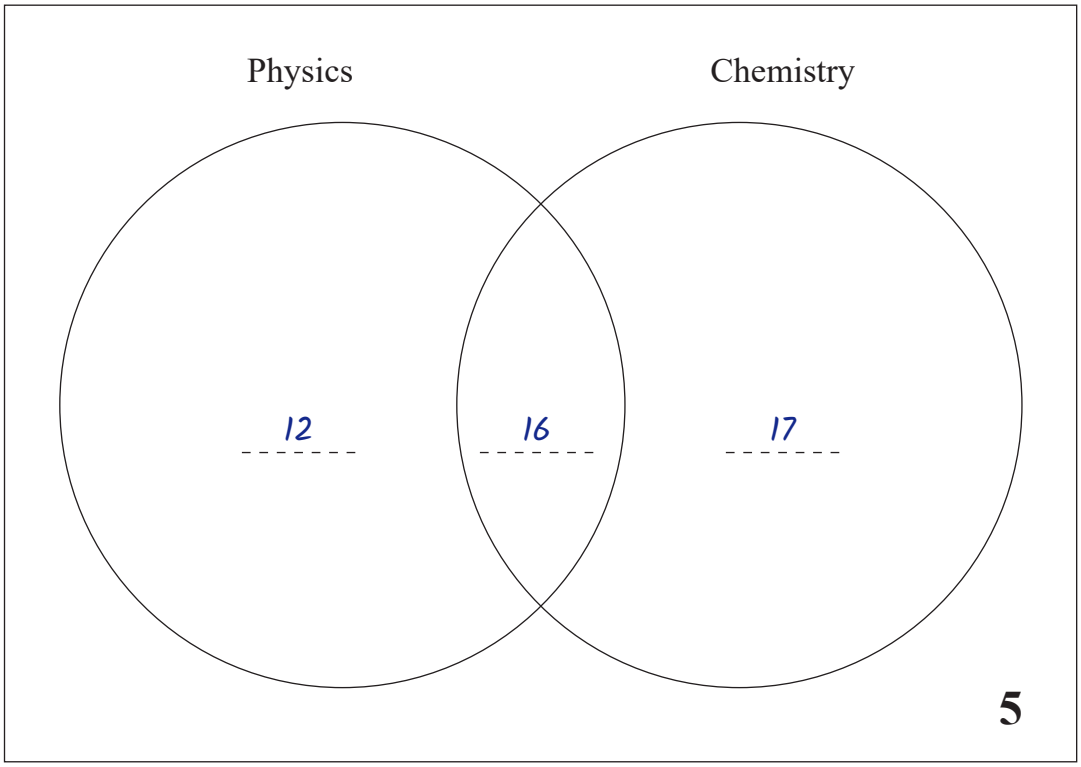
(c) Complete the sentence with the correct shape.

A net of Shape C would consist of 2 circles and a

rectangle. [1]

[Turn over

23



The Venn diagram represents 50 students.

12 students study Physics but not Chemistry.

28 students study Physics.

Complete the Venn diagram to find the number of students who study Chemistry but not Physics.

Physics only = 12

Both = 28 − 12 = 16

Chemistry only = 50 − 12 − 16 − 5 = 17

Answer *17* [3]

24 Pupils were asked to vote for how much homework they should get each week.

85 voted to have homework every night

105 voted not to have homework at all

110 voted to have homework on three nights per week

What percentage of pupils voted not to have homework at all?

Total pupils = 85 + 105 + 110 = 300

105 ÷ 300 × 100 = 35%

Answer 35 % [2]

25 Use your calculator to find the value of

$$\frac{47.8 - 4.5^2}{15.6 + 4.85}$$

Round your answer to 2 decimal places.

$4.5^2 = 20.25$, $47.8 - 20.25 = 27.55$

$15.6 + 4.85 = 20.45$

$27.55 \div 20.45 = 1.347188264...$

Answer 1.35 [2]

[Turn over

26 At a sports match

$\frac{5}{8}$ of the crowd supported the home team

$\frac{1}{3}$ of the crowd supported the away team

The rest of the crowd did not support either team.

What fraction of the crowd did not support either team?

$\frac{5}{8} + \frac{1}{3} = \frac{15}{24} + \frac{8}{24} = \frac{23}{24}$

$1 - \frac{23}{24} = \frac{1}{24}$

Answer $\frac{1}{24}$ [2]

27 A property developer bought a house for £84 000

He sold the house, making a profit of 12%

How much did he sell the house for?

Profit = 12% of 84 000 = 0.12 × 84 000 = 10 080

Selling price = 84 000 + 10 080 = 94 080

Answer £ *94 080* [3]

[Turn over

28 A quadrilateral has angles as shown in the diagram below.

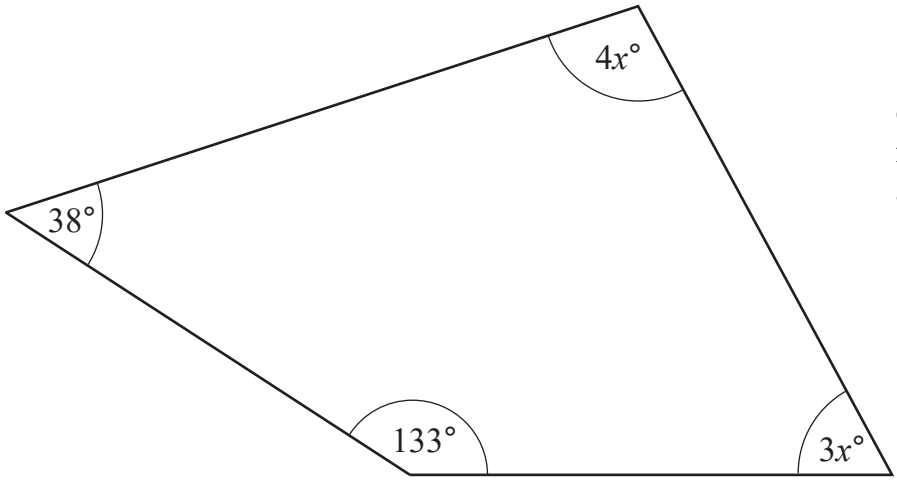


diagram not drawn accurately

Find the value of x

Show your working out clearly.

Angles in a quadrilateral add up to 360°

38 + 133 + 4x + 3x = 360

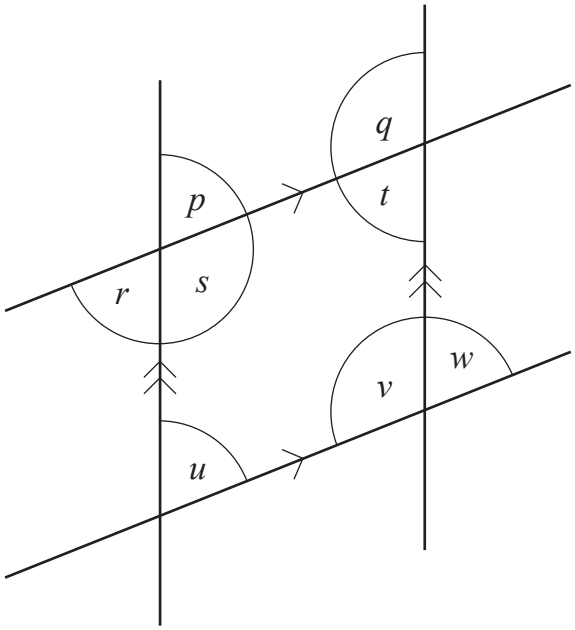
171 + 7x = 360

7x = 360 − 171 = 189

x = 189 ÷ 7 = 27

Answer $x =$ 27 [4]

29



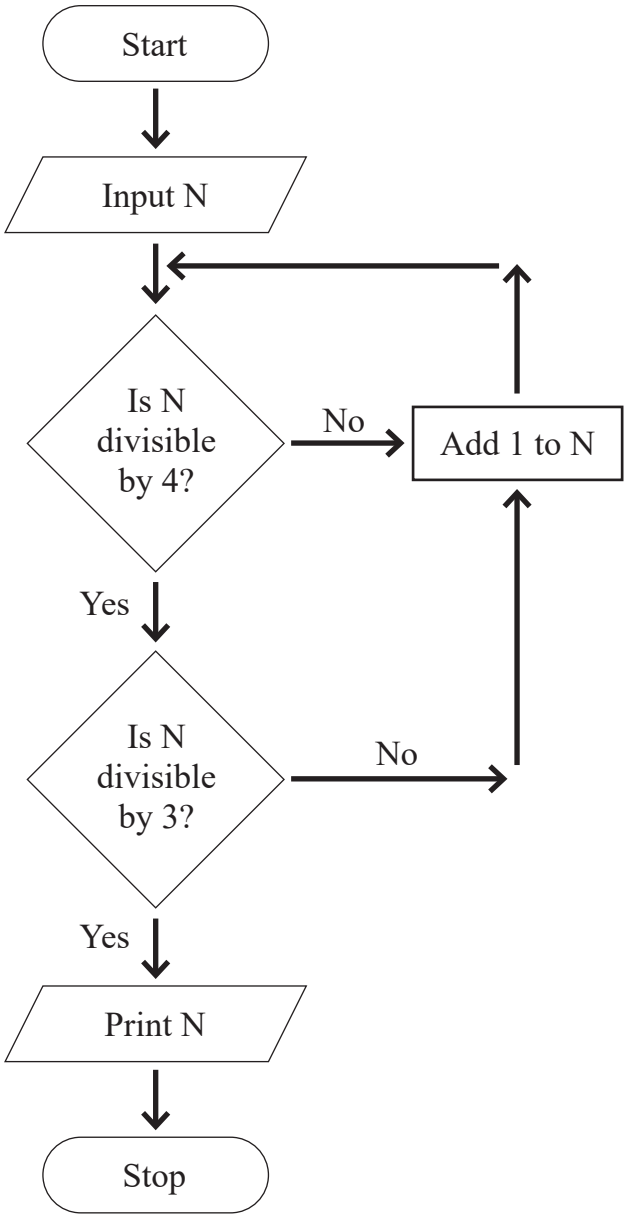
(a) Name an angle alternate to angle r Answer u [1]

(b) Name an angle corresponding to angle u Answer p [1]

(c) What is the sum of angle t and angle v? Answer 180 ° [1]

[Turn over

30 **(a)** Starting with N = 31, use the flow chart to find the number printed.



31 → 32: ÷ 4 yes, ÷ 3 no

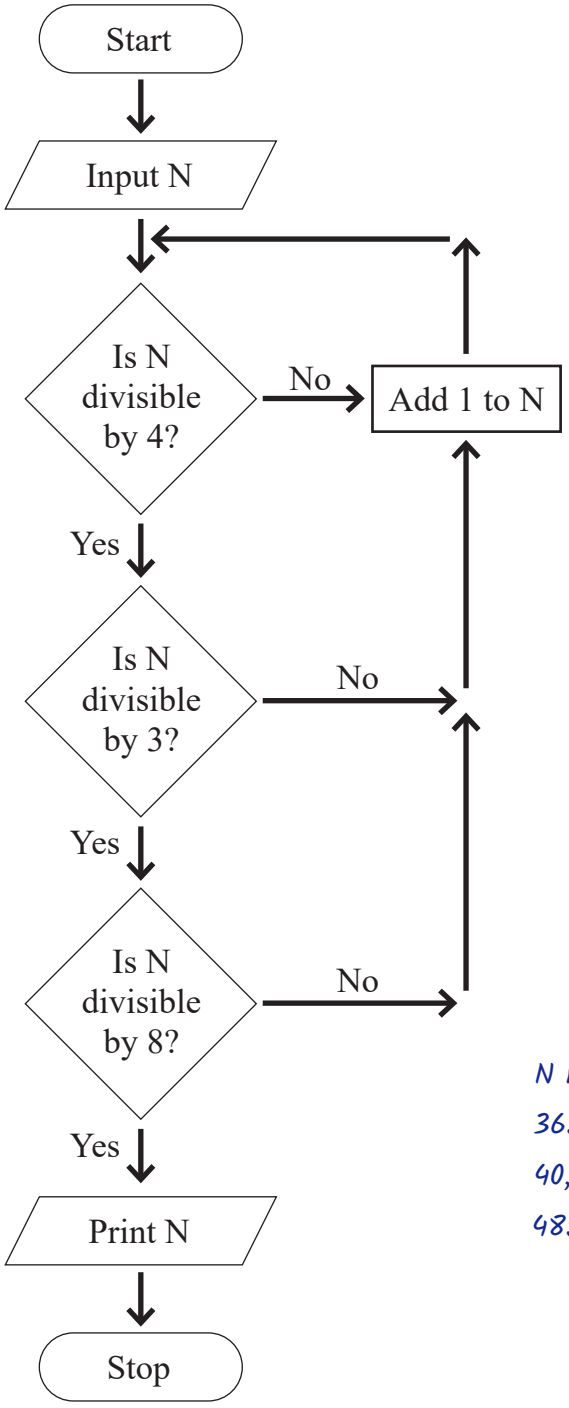
33, 34, 35: ÷ 4 no

36: ÷ 4 yes, ÷ 3 yes, so 36 is printed

Answer 36 [2]

(b) A third decision box is added.

Starting with N = 31, find the number printed now.



N must be ÷ 4, ÷ 3 and ÷ 8

36: not ÷ 8

40, 44: not ÷ 3

48: ÷ 4, ÷ 3 and ÷ 8 all yes

Answer 48 [1]

[Turn over

31 Barbara wants to investigate the number of hours adults spend on social media.

She gives a questionnaire to a random sample of 60 members of a pensioners' club.

One of the questions is shown below.

How many hours do you spend on social media?

1 – 5 ☐

5 – 10 ☐

10 – 20 ☐

(a) Give **one** criticism of the **sample** she has selected.

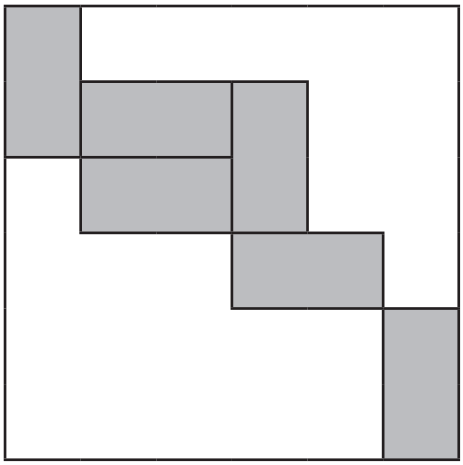
Answer *The sample is only pensioners, so it does not represent all adults (not all adults are pensioners).* [1]

(b) Give **two** criticisms of the **questionnaire**.

1 *No time period given (e.g. hours per day or per week?)*

2 *The groups overlap (5 is in 1 – 5 and 5 – 10) and there is no box for 0 hours or for more than 20 hours.* [2]

32 Six equal rectangles are placed inside a square of side 60 cm as shown in the diagram.



Calculate the area of the **unshaded** part of the square.

Show your working out clearly.

From the diagram, long side = 2 × short side

Across the square: short + long + long + short = 6 short

short = 60 ÷ 6 = 10 cm, long = 2 × 10 = 20 cm

One rectangle = 20 × 10 = 200 cm²

Square = 60 × 60 = 3600 cm²

Unshaded = 3600 − 6 × 200 = 3600 − 1200 = 2400

Answer *2400* cm^2 [4]

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Examiner Number

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