Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
November 2023

Mathematics

StemUp Model Solution

Unit M5 Paper 2
(With calculator)
Foundation Tier



[GMC52]

GMC52

THURSDAY 23 NOVEMBER, 10.45 am – 11.45 am

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

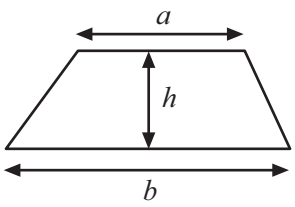
Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
You must answer the questions in the spaces provided.
Do not write outside the boxed area on each page, on blank pages or tracing paper.
Complete in black ink only. **Do not write with a gel pen.**
Answer **all seventeen** questions.
All working should be clearly shown in the spaces provided. Marks may be awarded for partially correct solutions.
You **may** use a calculator for this paper.

INFORMATION FOR CANDIDATES

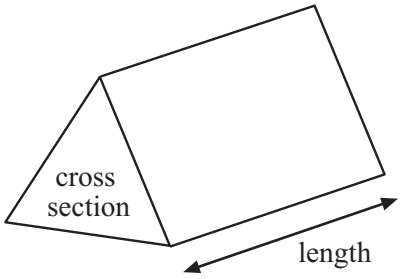
The total mark for this paper is 50.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a calculator, ruler, compasses and a protractor.
The Formula Sheet is on page 2.

Formula Sheet

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

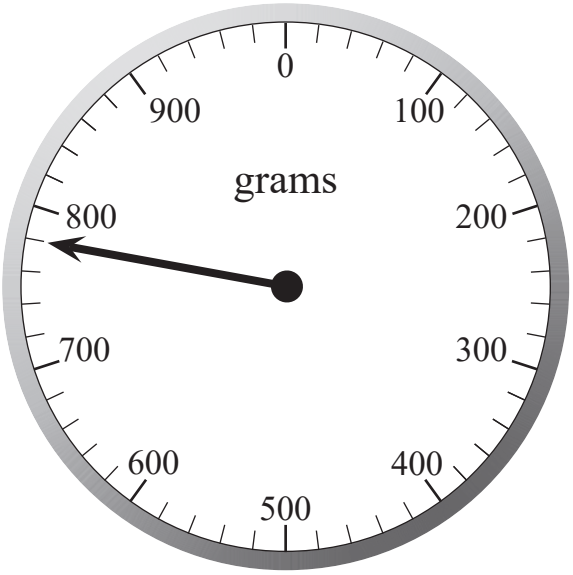


Volume of prism = area of cross section × length



1 **(a)** Vicky places some apples on a scale.

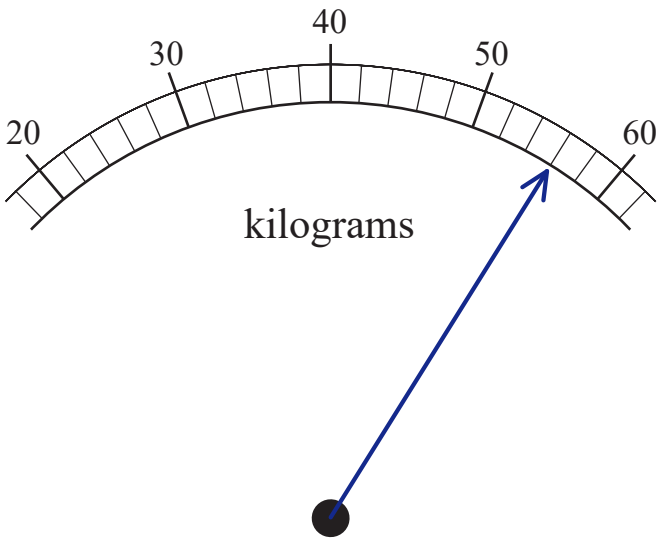
What is the reading shown on the scale?



Answer 780 grams [1]

(b) Chloe weighs 56 kilograms.

Draw an arrow on the scale to show how much Chloe weighs.

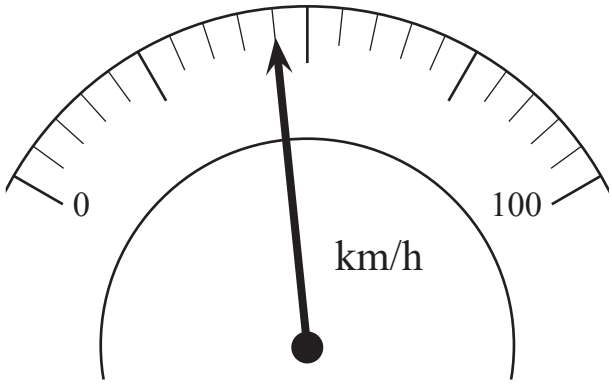


[1]

[Turn over

(c) Darren knows that the speed limit is 48 km/h.

His speedometer reads as shown.

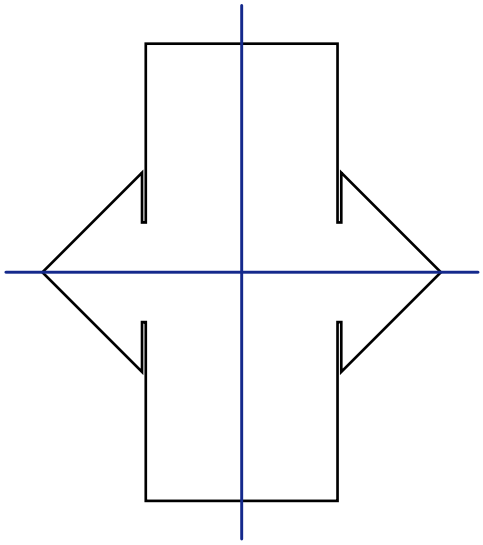


Is Darren breaking the speed limit?

Explain your answer clearly.

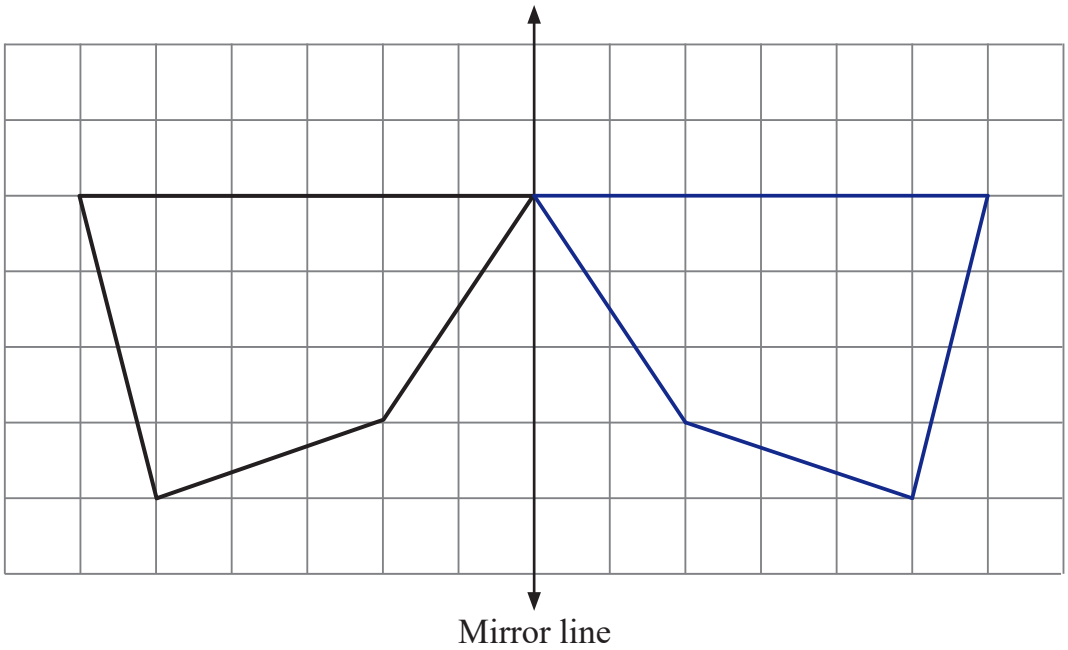
Answer No because the reading is 45 km/h, which is less than the speed limit of 48 km/h [2]

2 **(a)** Draw all the lines of symmetry on this shape.



[1]

(b) Reflect the given shape in the mirror line.



[2]

[Turn over

3 The names of 60 capital cities are put in a box.

The table shows information about their location.

Continent	Africa	Asia	Europe	South America
Number of capitals	13	5	30	12

Sarah takes one name at random from the box.

Circle the word that best describes the likelihood of these events.

(a) Sarah takes a capital in Europe.

impossible unlikely (evens) likely certain [1]

(b) Sarah takes a capital in South America.

impossible (unlikely) evens likely certain [1]

(c) Sarah takes a capital **not** in Asia.

impossible unlikely evens (likely) certain [1]

(a) 30 out of 60 = ½ (b) 12 out of 60 (c) 55 out of 60

4 Part of a sequence of numbers is shown.

3, 11, 19, 27, 35 …

(a) What is the next number in the sequence?

35 + 8 = 43

Answer 43 [1]

(b) Linda says that 90 is a term in the sequence.

Explain why she is wrong.

add 8 each time: 43, 51, 59, 67, 75, 83, 91
so 90 is never reached

Answer all the terms are odd numbers and 90 is even [1]

[Turn over

5

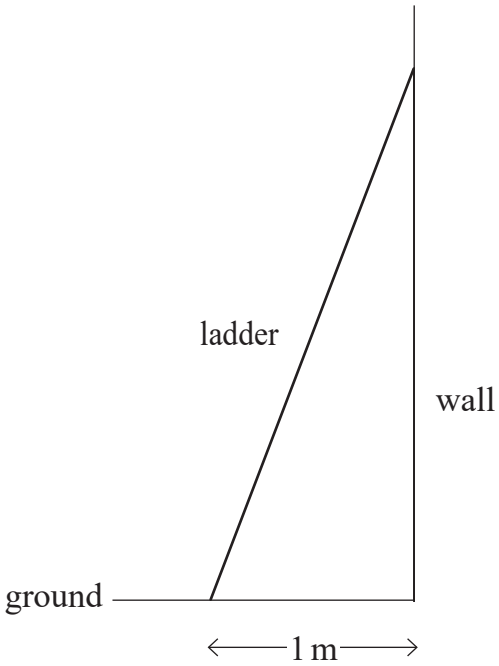


diagram not drawn accurately

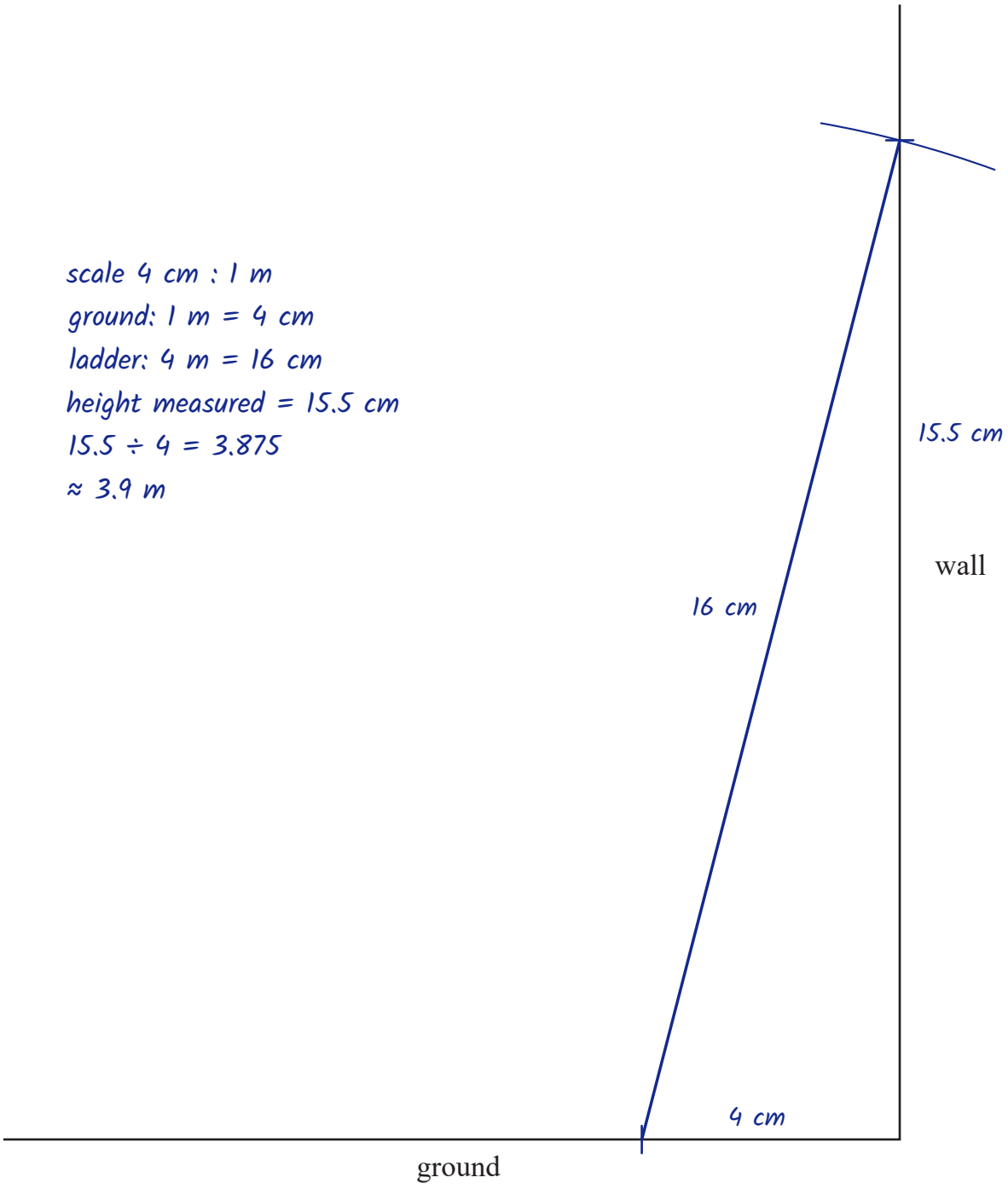
A ladder is 4 metres long.

The bottom of the ladder is 1 metre from a vertical wall.

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Use a scale drawing, with 4 cm : 1 m, to find the height of the top of the ladder above the ground.

scale 4 cm : 1 m
ground: 1 m = 4 cm
ladder: 4 m = 16 cm
height measured = 15.5 cm
15.5 ÷ 4 = 3.875
≈ 3.9 m



Answer 3.9 m [3]

[Turn over

6 Two companies offer Jack a job as a car mechanic.

The Car Guys will pay Jack £112.70 per day, working Monday to Friday.

Dr Auto will pay Jack £15.49 an hour for a 37-hour week.

Which company pays the higher weekly wage, and by how much?

Show your working.

The Car Guys: 112.70 × 5 = £563.50

Dr Auto: 15.49 × 37 = £573.13

difference: 573.13 − 563.50 = £9.63

Answer Dr Auto pays £ 9.63 more each week [3]

7 **(a)** Tom, a quarterback, weighs 16 stone 5 pounds.

1 stone = 14 pounds

What is Tom's weight in pounds?



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16 × 14 = 224
224 + 5 = 229

Answer 229 pounds [1]

(b) Andy, a rugby player, weighs 120 kg.

Who is heavier, Tom or Andy?

Show all working clearly.



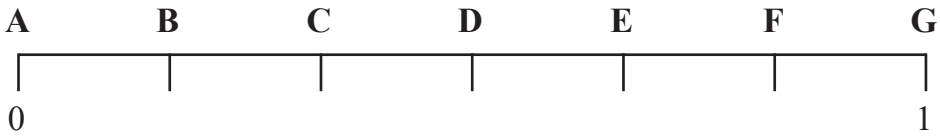
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1 kg ≈ 2.2 pounds
Andy: 120 × 2.2 = 264 pounds
Tom: 229 pounds
264 > 229

Answer Andy is heavier [2]

[Turn over

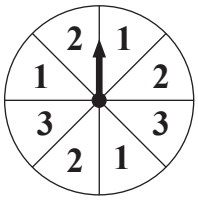
8



The probability scale shown has been labelled with letters **A** to **G**.

Write down **the letter** which matches the probability of the following events happening.

(a) This spinner is spun once.



It lands on a number less than 4

all the numbers 1, 2, 3 are less than 4
so certain, probability = 1

Answer G [1]

(b) A fair dice is thrown.



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It lands on an even number.

even: 2, 4, 6

$\frac{3}{6} = \frac{1}{2}$

Answer D [1]

(c) There are 12 beads in a bag.



Five beads are blue, three beads are pink, and the rest are yellow.

A bead is taken out of the bag at random.

The bead taken is yellow.

yellow = 12 − 5 − 3 = 4 $\frac{4}{12} = \frac{1}{3}$

Answer C [1]

9



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It takes 2 days to paint the outside of 6 houses.

(a) How long would it take to paint the outside of 15 houses?

6 houses take 2 days
15 ÷ 6 = 2.5
2.5 × 2 = 5 days

Answer 5 days [2]

(b) State one assumption you made in answering part **(a)**.

Answer all the painters work at the same rate
and all the houses are the same size [1]

[Turn over

10 Here are some numbers.

12	8	29
18	30	46
49	2	21

From the numbers given, write down

(a) the square number,

$7 \times 7 = 49$

Answer 49 [1]

(b) the cube number,

$2 \times 2 \times 2 = 8$

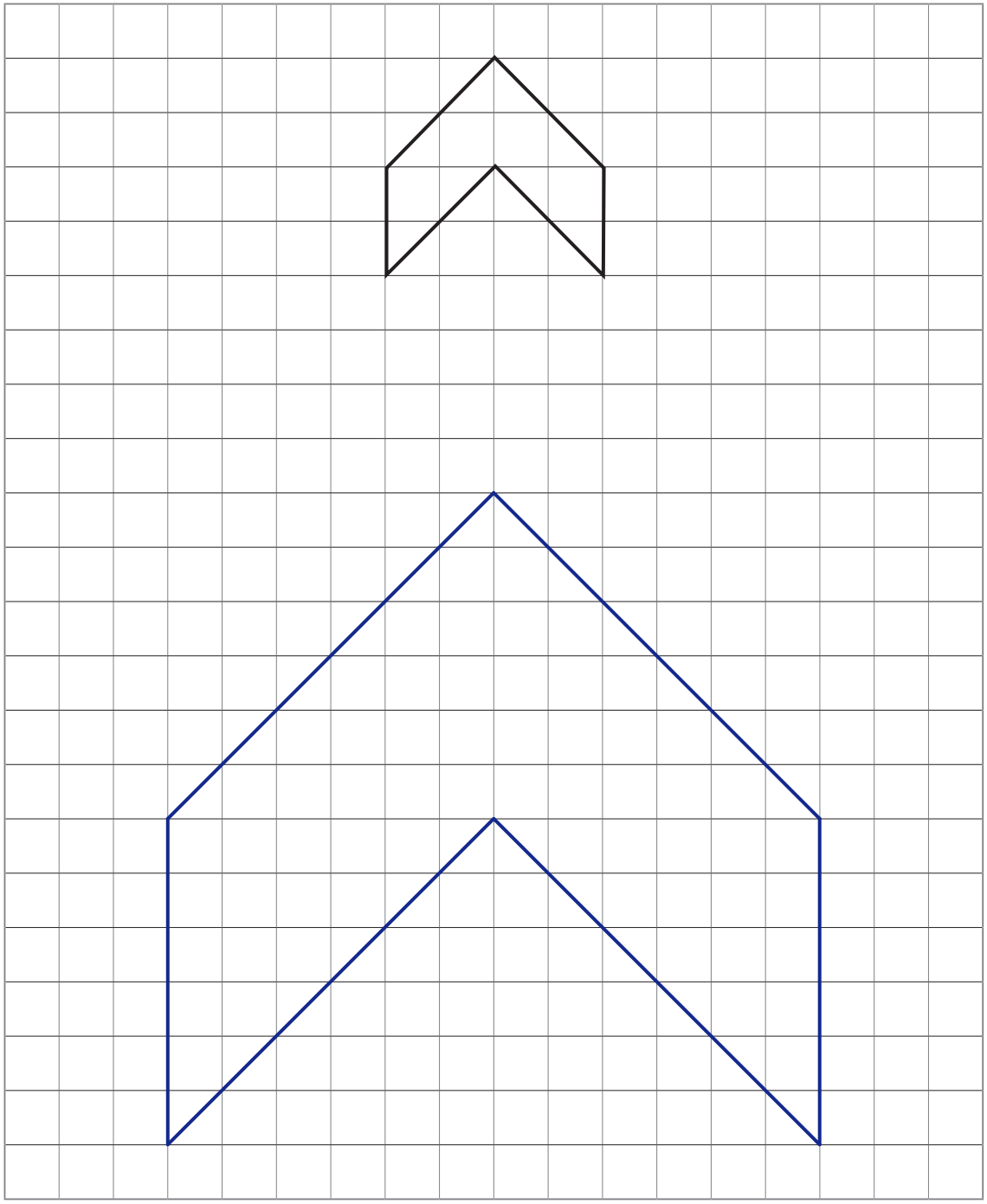
Answer 8 [1]

(c) the triangular number.

1, 3, 6, 10, 15, 21

Answer 21 [1]

11 Enlarge the shape on the grid below using a **scale factor of 3**



[3]

[Turn over

12 Conor mixes red, blue and yellow paint in the ratio 4 : 2 : 1

He uses 10 litres of blue paint.

He sells the mixed paint at a price of £18.25 per litre.

Work out the total price of the mixed paint.

red : blue : yellow = 4 : 2 : 1
blue: 2 parts = 10 litres
1 part = 10 ÷ 2 = 5 litres
total: 4 + 2 + 1 = 7 parts
7 × 5 = 35 litres
35 × 18.25 = £638.75

Answer £ 638.75 [3]

13



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A firm holds a Christmas raffle for its 20 employees.

The raffle tickets are numbered from 1 to 20

A ticket is drawn at random from a hat.

What is the probability that the ticket drawn is

(a) a number less than 10,

1 to 9: 9 numbers out of 20

Answer $\frac{9}{20}$ [1]

(b) a number more than 14,

15 to 20: 6 numbers

Answer $\frac{6}{20}$ [1]

(c) a prime number?

primes: 2, 3, 5, 7, 11, 13, 17, 19 = 8

Answer $\frac{8}{20}$ [1]

[Turn over

14 Julie collects 50 p coins.

70 of these coins weigh 560 g.

What is the **value** of 880 g of these coins?

70 coins = 560 g

1 coin = 560 ÷ 70 = 8 g

880 ÷ 8 = 110 coins

110 × £0.50 = £55

Answer £ 55 [3]

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15 Ben and Orla share the cost of a meal in the ratio 3 : 1

The meal costs £64

Ben then pays the taxi fare.

Ben pays a total of £60

How much is the taxi fare?

3 + 1 = 4 parts

64 ÷ 4 = 16

Ben: 3 × 16 = £48

taxi: 60 − 48 = £12

Answer £ 12 [3]

[Turn over

16 Data is recorded about the age and treatment received by patients who visit a dentist on a Monday.

	Patients aged 30 or under	**Patients aged over 30**
Filling	9	6
Extraction	5	13

(a) What is the probability that one of these patients selected at random is over 30 and has an extraction?

total = 9 + 6 + 5 + 13 = 33

Answer $\frac{13}{33}$ [1]

(b) One of the patients aged 30 or under is selected at random.

What is the probability that this patient has a filling?

30 or under: 9 + 5 = 14

Answer $\frac{9}{14}$ [1]

17 A sketch of an irregular pentagon is shown.

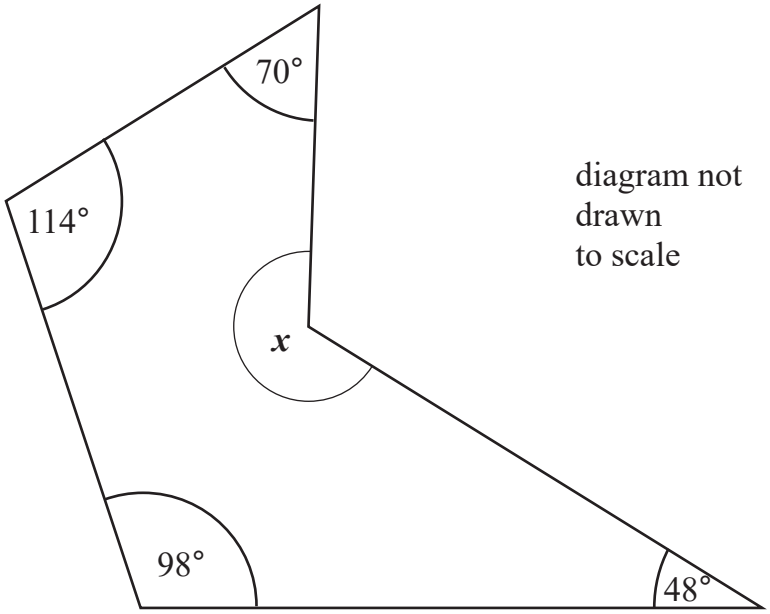


diagram not drawn to scale

Calculate the value of x.

Show all your working.

angles in a pentagon = (5 − 2) × 180 = 540°

x = 540 − (114 + 98 + 48 + 70)

x = 540 − 330

x = 210°

Answer 210 ° [3]

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