Rewarding Learning

General Certificate of Secondary Education

Centre Number

Candidate Number

Mathematics

StemUp Model Solution

Unit M1
(With calculator)
Foundation Tier



[GMC11]
Assessment

GMC11

Assessment Level of Control:
Tick the relevant box (✓)

Controlled Conditions	
Other	

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.**
Answer **all twenty-seven** 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.

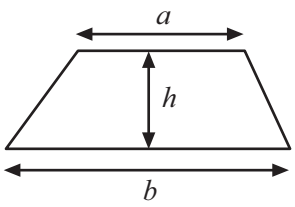
INFORMATION FOR CANDIDATES

Functional Mathematics is assessed in this unit.
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.

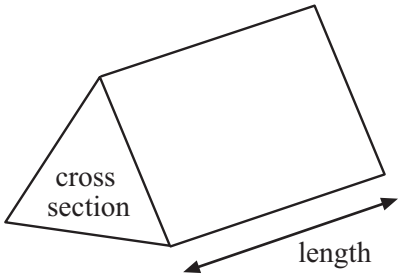
12368.05 **R**

Formula Sheet

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



Volume of prism = area of cross section × length



1 Class 12P raised £275 for charity.

Class 12T raised £312 for charity.

(a) How much money was raised in total by the two classes?

275 + 312 = 587

Answer £ 587 [1]

(b) How much more money was raised by Class 12T?

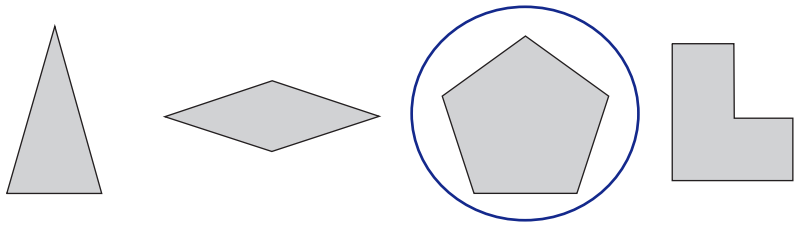
312 − 275 = 37

Answer £ 37 [1]

[Turn over

2 **(a)** Which shape below is a regular polygon?

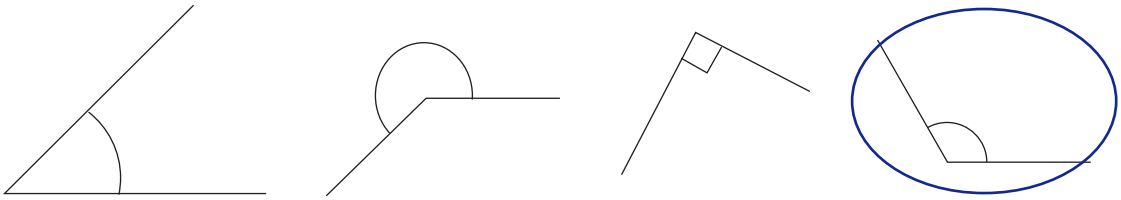
Circle your answer.



[1]

(b) Which angle below is obtuse?

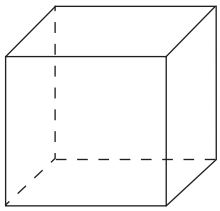
Circle your answer.



[1]

(c) How many vertices has a cube?

Circle your answer.



(8) 6 12 4

[1]

3 Barry downloads five films.

The films and their lengths are shown.

Sum Like It Hot 90 minutes	Math Ado About Nothing 125 minutes	The Times Tables Machine 85 minutes	Charlie's Angles 105 minutes	10^2 and 1 Dalmations 140 minutes

(a) Which film is closest in length to two hours?

2 hours = 120 minutes
125 – 120 = 5 minutes (closest)

Answer Math Ado About Nothing [1]

(b) Barry starts watching Sum Like It Hot at 8.30 pm.

What time will the film end?

90 minutes = 1 hour 30 minutes
8.30 pm + 1 h 30 min = 10.00 pm

Answer 10 pm [1]

(c) Which two films have a total length of 3 hours and 15 minutes?

3 hours 15 minutes = 180 + 15 = 195 minutes
90 + 105 = 195 minutes

Answer Sum Like It Hot and Charlie's Angles [2]

[Turn over

4 The table shows information about ten dogs at an Animal Rescue Centre.

Breed	Size	Weight (kg)	Recommended amount of food per day (grams)	Average life expectancy (years)
Basenji	Medium	11	205	13
Basset Hound	Large	23	370	12.5
Boxer	Large	33	475	9
Chihuahua	Small	2.3	50	16
Doberman Pinscher	Large	40	550	11
Fox Terrier	Small	8	165	11.5
Great Dane	Large	72	935	8.5
Kerry Blue Terrier	Medium	17	290	13.5
Westie	Small	8	160	13
Whippet	Medium	15	265	13.5

(a) What breed has the longest average life expectancy?

longest = 16 years

Answer Chihuahua [1]

(b) What breed is the heaviest of the medium size dogs?

Medium: 11, 17, 15 kg

Answer Kerry Blue Terrier [1]

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(c) Victoria is looking for a dog that

weighs no more than 15 kg

has a life expectancy of at least 12 years and

eats less than 200 g of food per day

Which two breeds should she consider?

Basenji 205 g (too much), Fox Terrier 11.5 years (too short)
Chihuahua: 2.3 kg, 16 years, 50 g
Westie: 8 kg, 13 years, 160 g

Answer _____*Chihuahua*_____ and _____*Westie*_____ [2]

[Turn over

5 The heights of five brothers are shown below.

Alf	Bob	Chris	Dave	Eddie
1.26 m	1.07 m	1.41 m	1.30 m	1.18 m

They line up for a family photograph in order of height.

(a) Who is the tallest?

Answer Chris [1]

(b) Who is in the middle of the photograph?

Answer Alf [1]

order: 1.07, 1.18, 1.26, 1.30, 1.41

The boys timed themselves running to the bottom of the garden.

Their times are shown below.

Alf	Bob	Chris	Dave	Eddie
8.5 seconds	9 seconds	7.6 seconds	7.45 seconds	8.07 seconds

(c) Who has the fastest time?

Answer Dave [1]

(d) What is the difference between the times for Bob and Chris?

9 − 7.6 = 1.4

Answer 1.4 seconds [1]

6

Jenny's Driving School	
1st Lesson FREE	
Lessons 2–5:	£20 each
From Lesson 6:	£25 each lesson

(a) Melanie books five lessons.

How much does this cost?

Lesson 1 = £0
4 × £20 = £80

Answer £ 80 [1]

(b) Naomi books lessons costing a total of £255

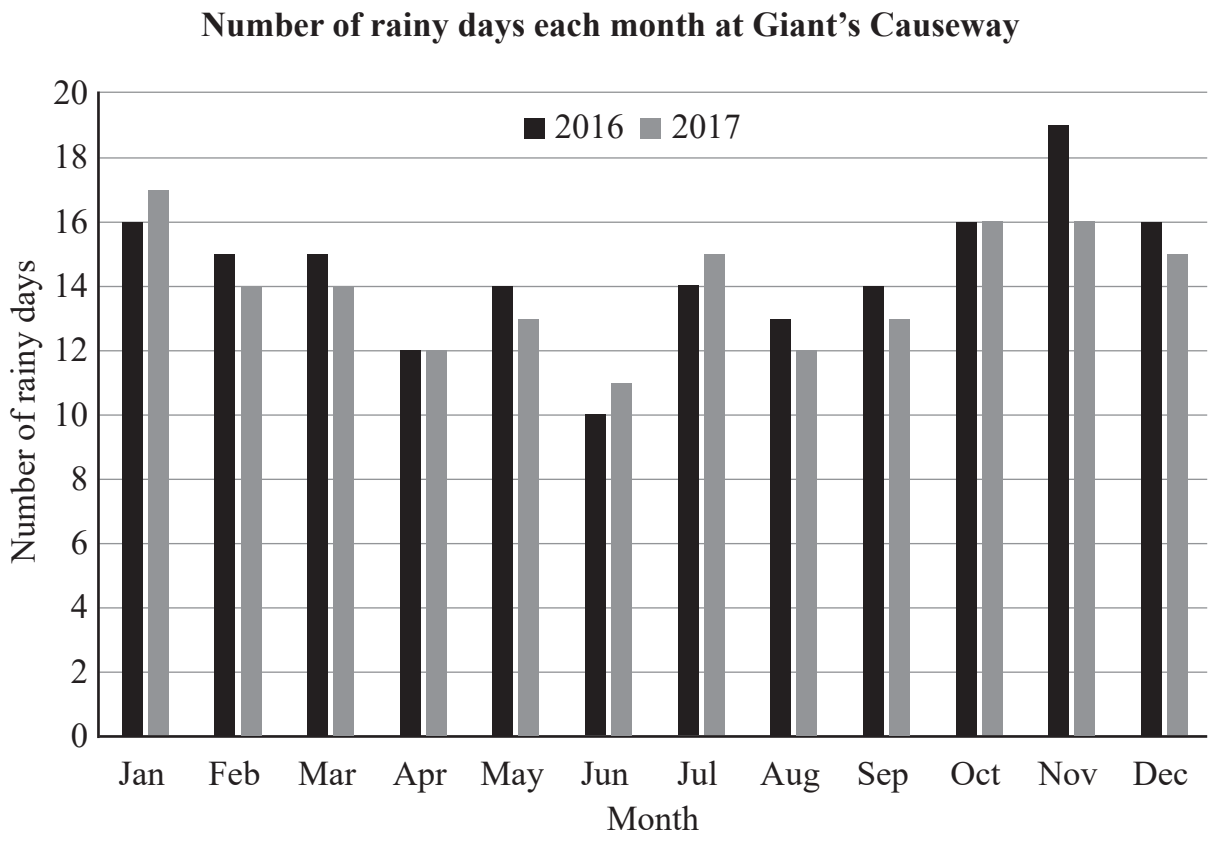
How many lessons does she book?

Lessons 1 to 5 cost £80
255 − 80 = 175
175 ÷ 25 = 7 more lessons
5 + 7 = 12 lessons

Answer 12 [3]

[Turn over

7 The chart shows the number of rainy days each month over two years at Giant's Causeway.



(a) How many rainy days were there in November 2016?

Answer 19 [1]

(b) Based on the information shown which is the driest month?

Jun: 10 + 11 = 21 (fewest)

Answer June [1]

There is only one month that had rain on exactly half of its days.

(c) Which month and year is this?

Feb 2017: 28 days ÷ 2 = 14

Answer Month February

Year 2017 [1]

8 **(a)** The colours of 10 cars were recorded as:

red white black green white white blue grey blue yellow

(i) What is the modal colour of the cars?

white appears 3 times (most often)

Answer White [1]

(ii) Explain why it is not possible to find the **median** colour of the cars.

Answer the colours are not numbers, so they cannot be put in order [1]

(b) Five basketball players have the shoe sizes shown below.

$14 \quad 10 \quad 10\frac{1}{2} \quad 13 \quad 12\frac{1}{2}$

(i) What is the range of the shoe sizes?

14 − 10 = 4

Answer 4 [1]

(ii) Calculate the mean shoe size.

(14 + 10 + 10.5 + 13 + 12.5) ÷ 5
= 60 ÷ 5 = 12

Answer 12 [3]

[Turn over

9 A supporters' club can buy match tickets for £7.50 each.

They have £200 to spend.

(a) What is the greatest number of tickets they can buy?

200 ÷ 7.50 = 26.666...
so 26 tickets

Answer 26 [3]

(b) How much money will be left?

26 × 7.50 = 195
200 − 195 = 5

Answer £ 5 [2]

(c) At the match there is food and drink for sale.

Burger	£3.50
Hot Dog	£2.20
Pastie	£1.60
Chips	£2.40
Soft Drink	£1.30

Graeme has a £10 note.

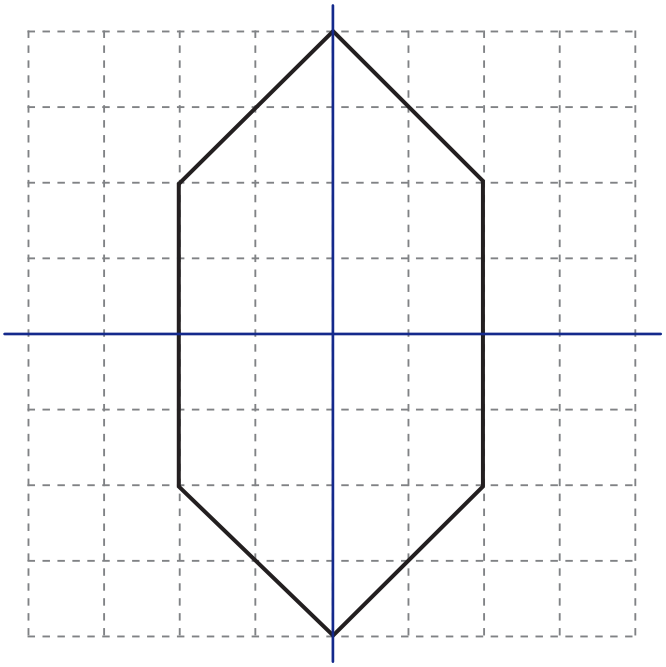
£10 − £4.70 = £5.30
1.60 + 2.40 + 1.30 = 5.30

He buys three items and gets £4.70 change.

What three items did he buy?

Answer Pastie , Chips , Soft Drink [2]

10 A shape is drawn on a centimetre squared grid as shown below.



(a) Work out the area of the shape.

rectangle 4 × 4 = 16
triangles 2 × (½ × 4 × 2) = 8
16 + 8 = 24

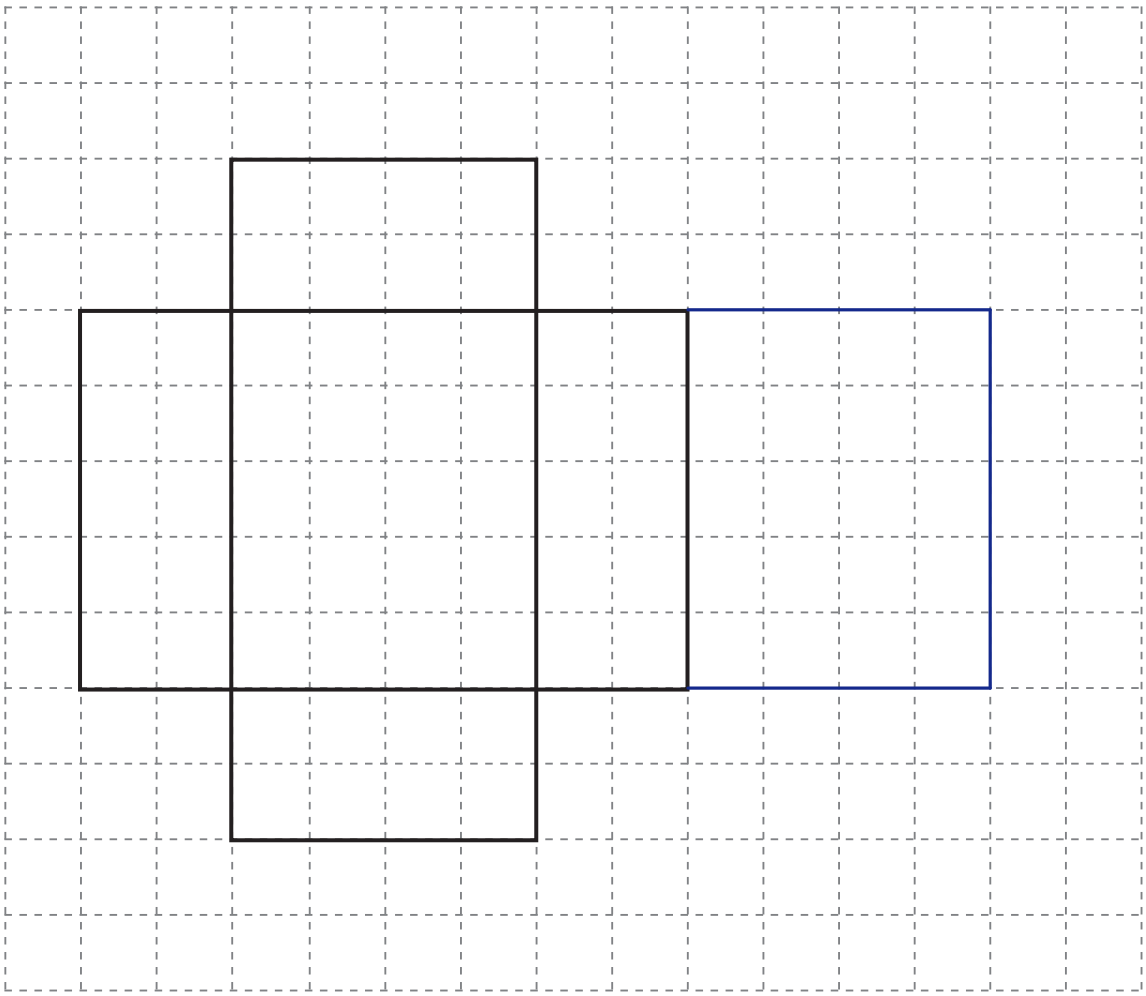
Answer 24 cm^2 [1]

(b) Draw all the lines of symmetry on the shape. [1]

[Turn over

11 Part of the net of a cuboid is drawn on centimetre squared paper.

One face is missing.



(a) Complete the net by drawing the missing face. [1]

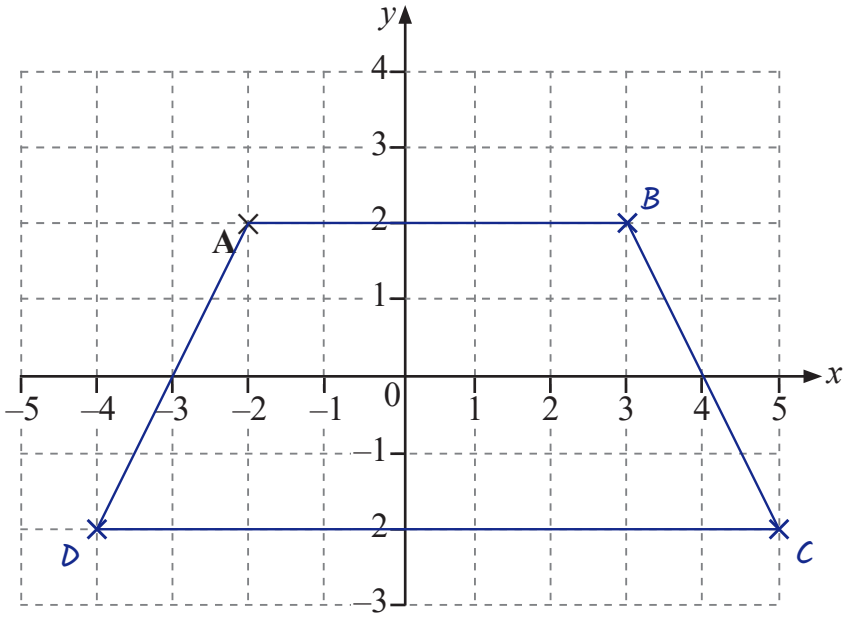
(b) The net is folded up to make a cuboid.

Work out the volume of the cuboid.

dimensions 5 cm, 2 cm and 4 cm
V = 5 × 2 × 4 = 40

Answer *40* cm^3 [3]

12



Look at the coordinate grid above.

The point A (–2, 2) has been plotted for you.

(a) Plot and label the points B (3, 2) and C (5, –2) on the grid. [2]

(b) Plot and label a point D on the grid so that ABCD is a trapezium. [1]

[Turn over

13 James and Zach are trying to find the value of $3 + 4 \times 5$

James says it is 35

Zach thinks it is 23

Who is correct?

Give a reason for your answer.

4 × 5 = 20 (multiply before adding)
3 + 20 = 23

Answer Zach because × before +: 3 + 20 = 23 [2]

14 Solve the equations

(a) $5w = 80$

$w = 80 \div 5$

Answer $w =$ 16 [1]

(b) $\frac{t}{8} = 4$

$t = 4 \times 8$

Answer $t =$ 32 [1]

(c) $30 = c + 18$

$c = 30 - 18$

Answer $c =$ 12 [1]

(d) $9n - 2 = 52$

$9n = 52 + 2$
$9n = 54$
$n = 54 \div 9 = 6$

Answer $n =$ 6 [2]

[Turn over

15 A sports team recorded information about whether players were able to play on Saturday only, Sunday only, or both.

(a) Complete the two-way table below.

	Saturday only	Sunday only	Both Saturday and Sunday	
Defenders	5	2	0	7
Midfielders	4	1	3	8
Attackers	2	3	1	6
	11	6	4	21

[2]

(b) The team decides to play on Saturday.

How many midfielders are able to play?

Saturday only + both = 4 + 3 = 7

Answer 7 [1]

16 Simplify the expression

$$6e - 5w + 2e - 4w$$

6e + 2e = 8e
−5w − 4w = −9w

Answer 8e − 9w [2]

17 Jake earns £1400 each month.

Every month he pays 4% of his earnings into a savings scheme.

How much money will he have paid into this scheme after three months?

4% of £1400 = 1400 ÷ 100 × 4
= £56 per month
56 × 3 = 168

Answer £ 168 [3]

[Turn over



18 Martin asks 20 workers how many hours they normally work in a week.

The results are shown in the stem and leaf diagram below.

0	8								
1	3	7							
2	2	5	8						
3	2	2	4	6					
4	0	0	2	4	4	4	7	8	
5	1	3							

Key 4 | 2 means 42 hours

(a) For the data above, work out

(i) the range,

53 − 8 = 45

Answer 45 hours [1]

(ii) the median.

10th, 11th: (36 + 40) ÷ 2

Answer 38 hours [1]

(b) Another worker normally works 39 hours in a week.

This value is added to the stem and leaf diagram.

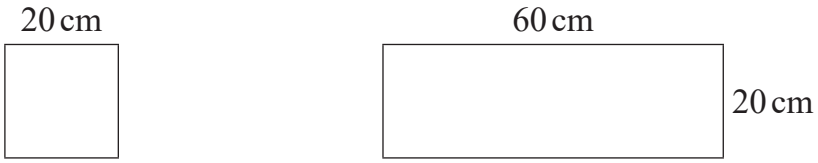
Circle the correct word or words to make each of the following statements correct.

(i) The mode will increase / decrease / (stay the same) [1]

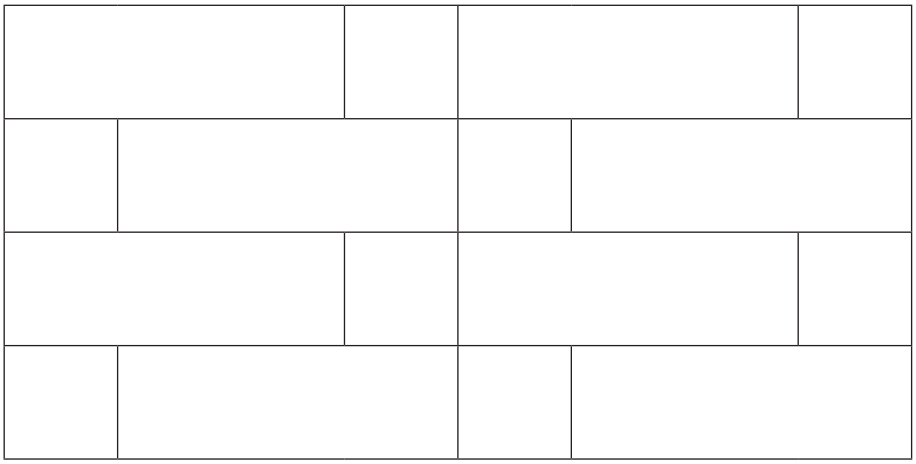
(ii) The range will increase / decrease / (stay the same) [1]

(iii) The median will (increase) / decrease / stay the same [1]

19 A garden table is tiled using square tiles and rectangular tiles, as shown below.



The tiled table looks like this.



Work out the **perimeter** of the table.

Give your answer in **metres**.

length = 60 + 20 + 60 + 20 = 160 cm
width = 4 × 20 = 80 cm
perimeter = 160 + 160 + 80 + 80 = 480 cm
480 cm ÷ 100 = 4.8 m

Answer 4.8 m [3]

[Turn over

20 Louise normally works 38 hours per week and is paid £9.80 per hour.

If she works any extra hours, she is paid at the overtime rate of £14.50 for each extra hour.

Last week her total earnings were £473.90

How many **extra** hours did she work last week?

38 × 9.80 = £372.40
473.90 − 372.40 = £101.50
101.50 ÷ 14.50 = 7

Answer 7 [3]

21 Wayne wants to travel from Glasgow to Carlisle by train.

Glasgow	Depart	17:42
Carlisle	Arrive	20:11

How long will this journey take?

17:42 to 18:00 = 18 mins
18:00 to 20:00 = 2 hours
20:00 to 20:11 = 11 mins
2 hours + 18 + 11 mins = 2 hours 29 mins

Answer 2 hours 29 minutes [3]

22 Suzie notices this sign in her local takeaway.

5% charge on card payments
for orders under £15

She orders food costing £12.80 and decides to pay by card.

How much will she have to pay in total?

5% of £12.80 = 12.80 ÷ 100 × 5 = £0.64
12.80 + 0.64 = 13.44

Answer £ 13.44 [3]

[Turn over

23 A group of 10 people sat their driving theory test.

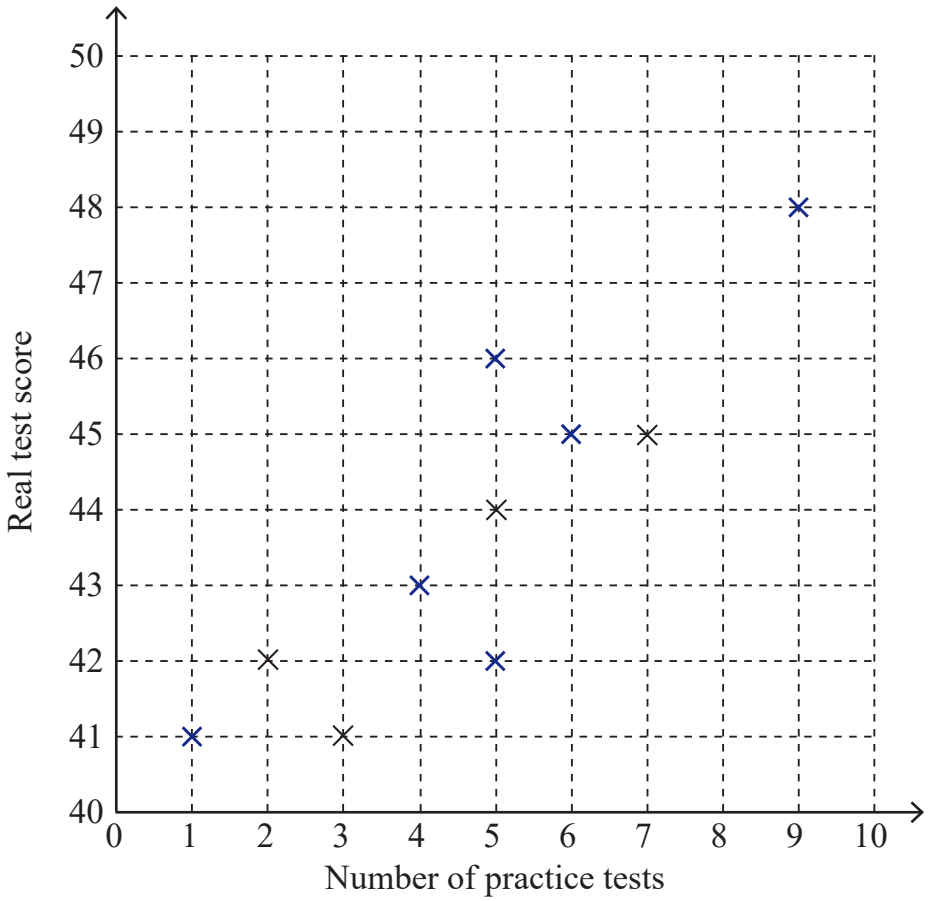
Their driving instructor recorded how many practice tests they did and their score in the real test.

The information is recorded in the table below.

Person	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Number of practice tests	**2**	**5**	**3**	**7**	4	1	9	6	5	5
Real test score	**42**	**44**	**41**	**45**	43	41	48	45	46	42

(a) Show this information on the scatter graph below.

The first four points have been plotted for you. [2]



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(b) The pass mark for the test is 44

How many of the 10 people passed the test?

B, D, G, H, I scored 44 or more

Answer 5 [1]

(c) Complete the statement:

"In general, the more practice tests completed,

the higher the test score." [1]

[Turn over

24 A cinema ticket for an adult costs £t

A cinema ticket for a child costs £3

James bought four adult tickets and seven child tickets.

The total cost was £49

(a) Write down an **expression** for the cost of the four adult tickets.

Answer 4t [1]

(b) (i) Form an equation that can be solved to find the cost of an adult ticket.

Answer 4t + 21 = 49 [1]

(ii) Solve your equation to find the cost of an adult ticket.

4t + 7 × 3 = 49
4t + 21 = 49
4t = 49 − 21 = 28
t = 28 ÷ 4 = 7

Answer t = 7 [2]

25 Bob is going to pave a patio. He needs 480 paving slabs.

He looks in three different stores.

Garden Store	Perfect Patio Store	Quinn's Paving Store
32 slabs in a box	**80 slabs in a box**	**16 slabs in a box**
Box price = £27	**Box price = £70**	**Box price = £17**
	10% discount on 5 or more boxes	Buy 5 boxes, get one extra box free

Which store will be the cheapest for him to buy the slabs in?

Show all your working.

Garden Store: 480 ÷ 32 = 15 boxes
15 × £27 = £405
Perfect Patio: 480 ÷ 80 = 6 boxes
6 × £70 = £420, 10% of 420 = £42
420 − 42 = £378
Quinn's: 480 ÷ 16 = 30 boxes needed
buy 25 boxes, get 5 free = 30 boxes
25 × £17 = £425
£378 is the lowest, so Perfect Patio is the cheapest

Answer Perfect Patio Store [6]

[Turn over

26 The price of a phone was £620
The price is reduced by 30%.
Calculate the new price.

30% of £620 = 620 ÷ 100 × 30 = £186
620 − 186 = 434

Answer £ 434 [3]

27

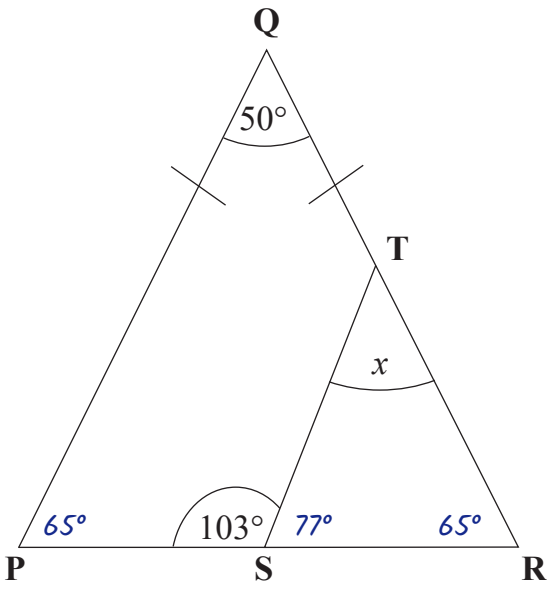


diagram not drawn accurately

Triangle PQR is isosceles with PQ = QR.

(a) Calculate the size of angle x

angle QPR = angle QRS = (180 − 50) ÷ 2 = 65°
angle TSR = 180 − 103 = 77°
x = 180 − (77 + 65) = 38°

Answer 38 ° [3]

(b) Hence decide if the lines PQ and ST are parallel.

No because angle PQR = 50° but angle STR = x = 38°

corresponding angles are not equal, so not parallel [2]

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