

- 4 A theme park asked 900 people to choose their favourite activity from a list of five. The pictogram shows the results for four of the activities.

Thrill rides		250
Family rides		125
Entertainment		200
Children's rides		✓
Water rides		275

} 850 ✓

Key: represents 100 people

- (a) (i) How many people chose entertainment?

200 ✓
(a)(i) [1]

- (ii) How many **more** people chose water rides than family rides?

275 - 125 ✓
150 ✓
(ii) [2]

- (iii) All 900 people chose one of the five activities.

Complete the pictogram for children's rides. [3]

$900 - 850 = 50$ ✓

- (b) Will plays a game at the theme park. There are 20 cards numbered from 1 to 20. Will takes a card at random. He wins if the card he chooses shows a prime number.

Work out the probability that Will wins. Give your answer as a fraction in its simplest form.

2, 3, 5, 7, 11, 13, 17, 19 ✓✓
= $\frac{8}{20}$ ✓

$\frac{2}{5}$ ✓

(b) [4]

- (c) A family ticket for the theme park costs £68. If the ticket is bought online it costs 15% less.

How much does it cost to buy a family ticket online?

OR
10% = 6.8 ✓
5% = 3.4 ✓
10.2
68 × 0.85 ✓

68 - 10 - 0.2 = 57.80 ✓

(c) £ [3]

5 Simplify.

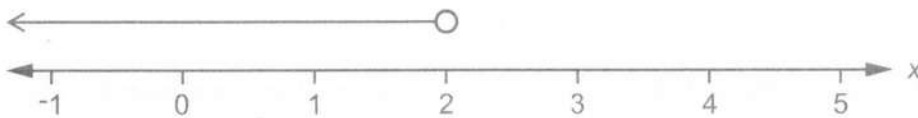
(a) $4a + 5a - 7a$

(a) $2a$ ✓ [1]

(b) $3g - 2f + 8g + 5f$

(b) $11g + 3f$ ✓ ✓ [2]

6 Write down the inequality shown on this number line.



$x < 2$ ✓ ✓ [2]

7 Factorise fully.

(a) $6 + 9y$

(a) $3(3y + 2)$ ✓ [1]

(b) $2x^2 + 6x$

(b) $2x(x + 3)$ ✓ ✓ [2]

8 Plaza United are playing a football match away from home.

- (a) 379 supporters are going to the match by coach.
Each coach seats 45 people.

What is the smallest number of coaches that will be needed?

$$379 \div 45 = 8.4...$$

9 ✓

(a) [2]

- (b) In their last 50 matches, Plaza United have drawn 10 matches, lost 5 and won the rest.

Sam claims

The probability that Plaza United will win this match is 0.7.

- (i) Show calculations to support Sam's claim.

[2]

$$W = 50 - 10 - 5 = 35 \quad \checkmark$$

$$W = \frac{35}{50} = \frac{7}{10} = 0.7 \quad \checkmark$$

- (ii) Give one reason why Sam's claim may not be reliable.

Past results could be against
weaker teams / home /

injury to best players

[1]

- 9 Mr and Mrs Jones buy cinema tickets for themselves and their three children. The cost of an adult ticket is £6 more than a child ticket. The total cost of the **five** tickets is £45.

Work out the cost of an adult ticket.

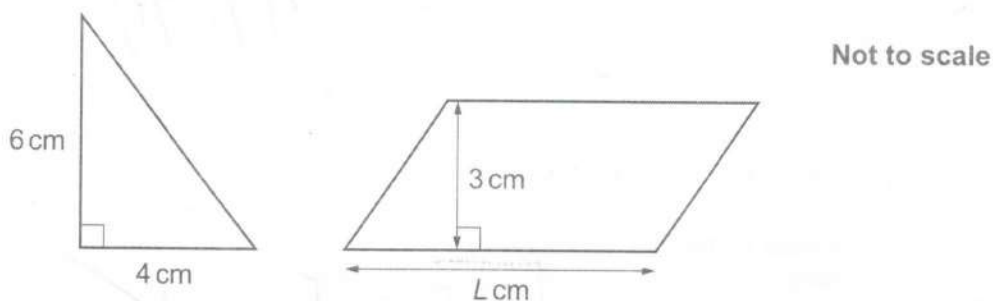
$$\begin{array}{ccccc} C & C & C & A & A \\ x & x & x & x+6 & x+6 \end{array} \checkmark$$

$$5x + 12 = 45 \checkmark$$

$$5x = 33 \checkmark$$

$$\begin{aligned} x &= 33 \div 5 \\ &= 6.60 \checkmark \end{aligned} \quad \text{An adult ticket costs £} \underline{12.60} \checkmark \quad [5]$$

- 10 The area of the parallelogram is four times the area of the triangle.



Calculate the length, L , of the parallelogram.

$$6 \times 4 = 24 \quad 24 \div 2 = 12 \checkmark \checkmark$$

$$12 \times 4 = 48 \quad \checkmark$$

$$48 \div 3 = 16 \checkmark$$

$$\underline{16} \checkmark$$

..... cm [5]

- 11 Harry has a job.
On Friday, he is paid £8.50 per hour.
On Saturday, he is paid $1\frac{1}{2}$ times that rate.

He works for 4 hours on Friday.

He works from 8 am until 1 pm on Saturday. = 5 ✓

How much does Harry earn in total for these two days?

(F)

$$8.50 \times 4$$

$$= \text{£}34 \quad \checkmark$$

(S)

$$8.5 \times 1.5 \times 5$$

$$= \text{£}63.75 \quad \checkmark$$

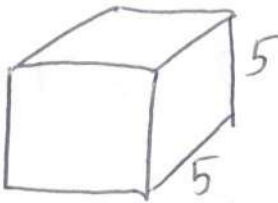
$$63.75 + 34 \quad \checkmark$$

$$= 97.75 \quad \checkmark$$

£..... [6]

- 12 The volume of a cube is 125 cm^3 .

Calculate the total surface area of the cube.
Give the units of your answer.



$$\sqrt{125} = 5 \quad \checkmark$$

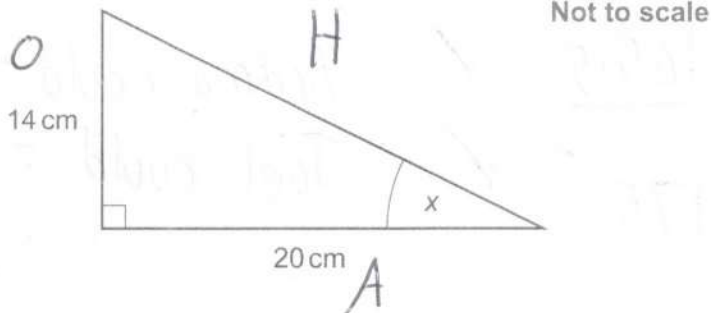
$$5 \times 5 \times 6 \quad \checkmark$$

$$150 \quad \checkmark$$

$$\text{cm}^2 \quad \checkmark \quad [5]$$

Turn over

- 13 Here is a right-angled triangle.



Show that angle x is 35° , correct to the nearest degree.

[3]



$$x = \tan^{-1} \left(\frac{14}{20} \right)$$

$$= 34.992\dots$$

$$= 35^\circ$$

- 14 Dean drives a distance of 760 km in 9 hours.
Robert drives a distance of 559 km in 6 hours 30 minutes.

Who has the highest average speed?
Show how you decide.



$$\text{Dean} = 760 \div 9 = 84.4$$

$$\text{Rob} = 559 \div 6.5 = 86$$

Robert

because

$$86 \text{ kph} > 84.4 \text{ kph}$$

[4]

- 15 Andrea is 165 cm tall, correct to the nearest cm.
Joel is 170 cm tall, correct to the nearest 10 cm.

Show that Andrea could be taller than Joel.

[3]

$$164.5 \leq \text{Andrea} < \underline{165.5} \quad \checkmark$$

$$\text{Andrea could} = 165.4$$

$$\underline{165} \leq \text{Joel} < 175 \quad \checkmark$$

$$\text{Joel could} = 165$$

✓ etc

- 16 Carol makes birthday cards.
Each card takes the same amount of time to make.

She makes 3 cards in 48 minutes.
She has an order for 80 cards.

Can she complete this order in 3 days if she works 8 hours each day?
Show how you decide.

$$3c = 48m \quad \checkmark$$

$$1c = 16m$$

$$80c = 16 \times 80 = 1280 \text{ mins} \quad \checkmark$$

$$3 \times 8 = 24 \text{ hrs} = 24 \times 60 \quad \checkmark$$

$$= 1440 \text{ mins} \quad \checkmark$$

Yes because the order takes 1280 mins, she has 1440 mins available. ✓ [5]

17 The table below shows the area, in square kilometres (km^2), of some countries.

Country	Area (km^2)
Australia	7.69×10^6
Latvia	6.46×10^4
Luxembourg	2.59×10^3
Russia	1.71×10^7
Singapore	7.24×10^2
Sweden	4.50×10^5

(a) Write the area of Sweden as an ordinary number.

(a) 450 000 ✓
..... km^2 [1]

(b) Which of the above countries has the smallest area?

(b) Singapore [1]

(c) Alexis says

The area of Australia is approximately three times larger than the area of Luxembourg.

Is she correct?
Show how you decide.

$$\frac{\text{Aus}}{\text{Lux}} = \frac{7.69 \times 10^6}{2.59 \times 10^3} = 2969 \dots \checkmark$$

Alexis is wrong because it is closer to being 3000 times bigger ✓
..... [2]

(d) Work out the total area of Russia and Australia.
Give your answer in standard form, correct to 2 significant figures.

$$(1.71 \times 10^7) + (7.69 \times 10^6) \checkmark$$

$$= \underline{24790000} \checkmark$$

(d) 2.5×10^7 ✓ ✓
..... km^2 [4]

- 18 Bob makes dry concrete by mixing cement, sand and stone in the ratio 1 : 2 : 3 by weight. He buys the cement, sand and stone in bags as shown in this table.

	Weight of bag (kg)	Cost per bag (£)
Cement	25	5.50
Sand	20	2.00
Stone	15	3.90

He packs the dry concrete into 30 kg bags.

$$50 \times 30 = 1500 \checkmark$$

Bob buys just enough cement, sand and stone to make 50 bags of dry concrete.

- (a) Show that Bob buys 500 kg of sand.

[3]

$$\begin{array}{ccc} C & Sa & St \\ 1 & 2 & 3 \end{array}$$

$$\text{Sand} = \frac{2}{6} \times 1500 = 500 \checkmark$$

- (b) Bob sells the 50 bags of dry concrete for a total of £396.

Calculate Bob's percentage profit.

$$\begin{array}{l} C = \frac{1}{6} \times 1500 = 250, \quad 250 \times 5.50 = \pounds 1375 \checkmark \\ \text{Sand} = \frac{500}{20} \times 2 = \pounds 50 \checkmark \\ St = \frac{3}{6} \times 1500 = 750, \quad \frac{750}{15} \times 3.9 = \pounds 195 \checkmark \end{array} \left. \begin{array}{l} \\ \\ \end{array} \right\} \pounds 300 \checkmark$$

$$\% \text{ profit} = \frac{96}{300} \times 100 = 32 \checkmark$$

(b) % [5]

(c) (i) Draw a line of best fit on the scatter diagram. ✓

[1]

(ii) Another student was absent for Test 2.
The student scored 40 marks on Test 1.

Use your line of best fit to estimate a result for this student on Test 2.

$\left[\begin{array}{c} 35 \\ \text{MS } \cancel{35} \rightarrow 44 \end{array} \right]$

(c)(ii)

39

[1]

(d) Work out the percentage of the 12 students whose result on Test 1 is **lower** than their result on Test 2.

$$\checkmark \frac{5}{12} \times 100$$

✓ ✓

41.7 ✓

(d)

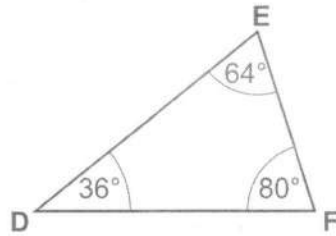
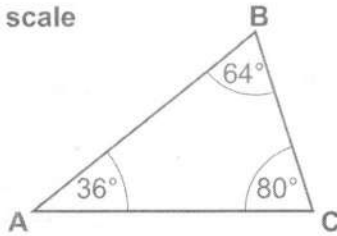
% [4]

Turn over for Question 20

Turn over

20 (a) Are these two triangles definitely congruent?
Give a reason.

Not to scale

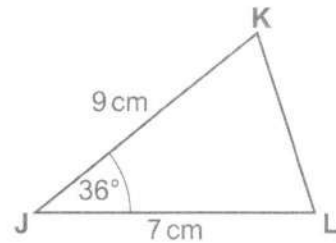
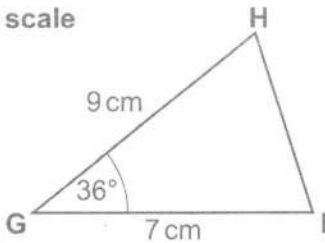


No because of unknown lengths ✓

[1]

(b) Prove that these two triangles are congruent.

Not to scale



\checkmark $GH = JK$
 \checkmark $\angle HGI = \angle KJL$
 $GI = JL$

} SAS hence congruent. ✓

[3]

END OF QUESTION PAPER

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