

Surname	Centre Number	Candidate Number
Other Names		0



GCSE – **NEW**

3310U10-1



S17-3310U10-1

MATHEMATICS – NUMERACY
UNIT 1: NON-CALCULATOR X
FOUNDATION TIER

THURSDAY, 25 MAY 2017 – MORNING

1 hour 30 minutes

ADDITIONAL MATERIALS

The use of a calculator is not permitted in this examination.
A ruler, a 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 continuation page at the back of the booklet, taking care to number the question(s) correctly.

Take π 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 4(a), the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

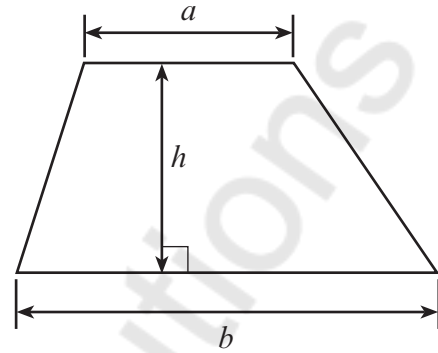
For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	4	
2.	9	
3.	5	
4.	9	
5.	5	
6.	4	
7.	3	
8.	8	
9.	6	
10.	9	
11.	3	
Total	65	



MAY173310U10101

Formula List - Foundation Tier

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



1. Owen buys houses in Wales. He then rents them out to people. He uses a website to find the average price for a detached house in 6 different counties.

Average House Prices (November 2015)

County	Average house price (£)
Anglesey	* 171 684 ✓
Carmarthenshire	* 158 973 ✓
Powys	<u>199 998</u> ✓
Cardiff	269 885 ✓
Neath Port Talbot	* - 144 762 ✓
Ceredigion	182 852 ✓

- (a) Calculate the difference between the average house price in the most expensive county and least expensive county. Give your answer correct to the nearest £1000. [2]

most expensive → £269,885
 least expensive → £144,762
 difference:

$$\begin{array}{r} 269\ 885 \\ - 144\ 762 \\ \hline 125\ 123 \end{array}$$

£125,000

- (b) Owen says,

"The average house price in four of the counties is less than £180 000."

Is Owen correct? Give a reason for your answer. [1]

Average house price < £180,000 for four counties
 So, there countries that has less than £180,000
 So, Owen is wrong: £171,684, £158,973, £144,762

- (c) Which of the following is the best approximation for the average house price in Powys? Circle your answer. [1]

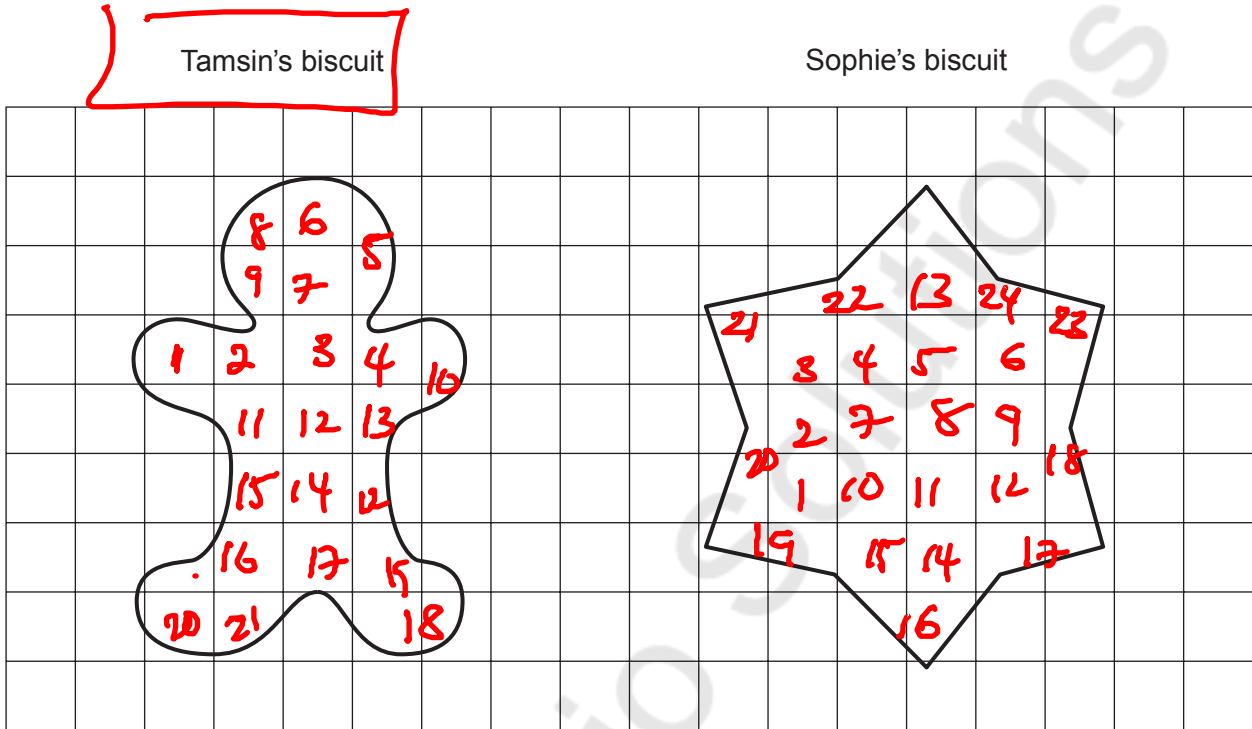
£199 990 £199 900 £199 000 £190 000 £200 000

Powys → 199,998
 199,990
 200,000
 199,000



2. (a) Tamsin and Sophie make biscuits.
They plan to cover the top surface of each biscuit with the same thickness of chocolate.

The biscuits are shown on the centimetre squared grid below.



Tamsin thinks that Sophie's biscuit will need more chocolate to cover it.
Estimate the area of each biscuit.
Decide whether or not Tamsin is correct.
Show all your working.

[3]

1 square is 1cm^2

Approx Area of Tamsin Biscuit = 20cm^2

Approx Area of Sophie's Biscuit = 24cm^2

Tamsin is correct because Sophie's
Biscuit has more area than Tamsin

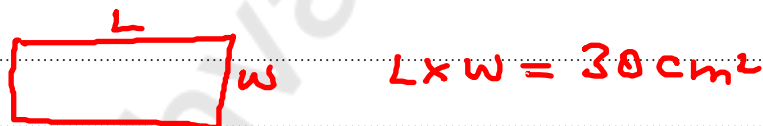


- (b) Tamsin and Sophie have carried out a survey to find which biscuits are the most popular. The four most popular biscuits are chocolate cookies, custard creams, jammy dodgers and digestives. Design a tally chart that Tamsin and Sophie could have used to collect their data and show their results. [3]

Tally chart

<u>Name of biscuit</u>	<u>Frequency</u>	<u>Tally</u>
Chocolate cookies	8	
custard creams	4	
Jammy dodgers	12	
Digestives	17	

- (c) Tomas makes rectangular biscuits. The top of each biscuit has a surface area of 30 cm^2 . Tomas covers the surface area of the top of each biscuit with chocolate. The chocolate costs 3 pence per 10 cm^2 . Calculate the cost of covering 200 of these biscuits with chocolate. [3]



$$10 \text{ cm}^2 \text{ cost } 3 \text{ pence}$$

$$1 \text{ biscuit} \rightarrow 30 \text{ cm}^2 = 10 \text{ cm}^2 + 10 \text{ cm}^2 + 10 \text{ cm}^2$$

$$3 \text{ p} + 3 \text{ p} + 3 \text{ p}$$

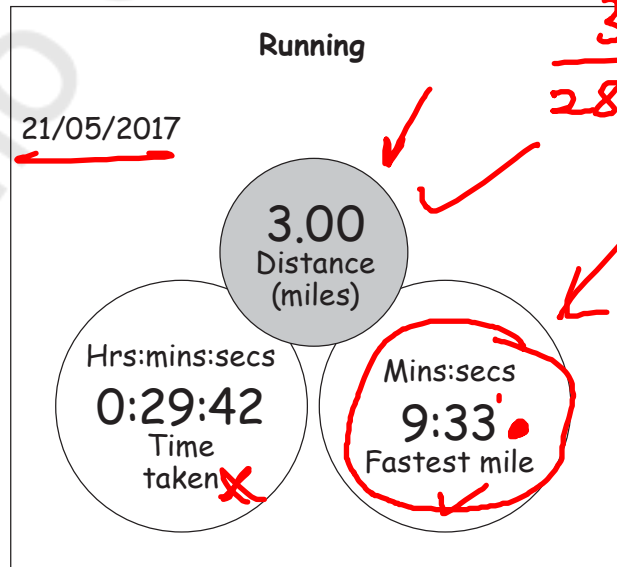
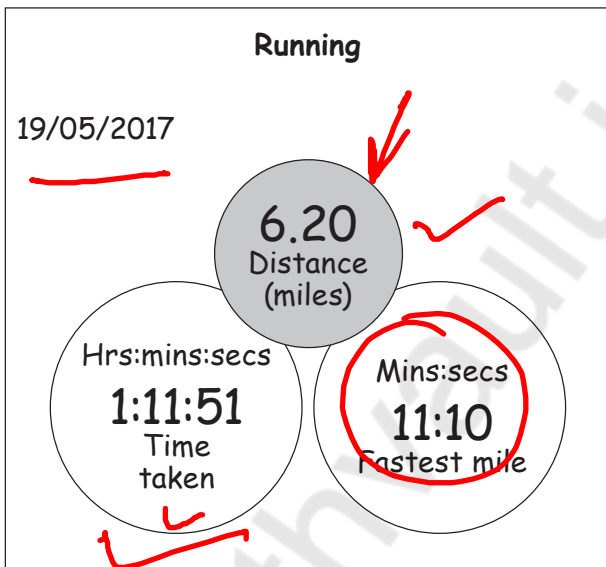
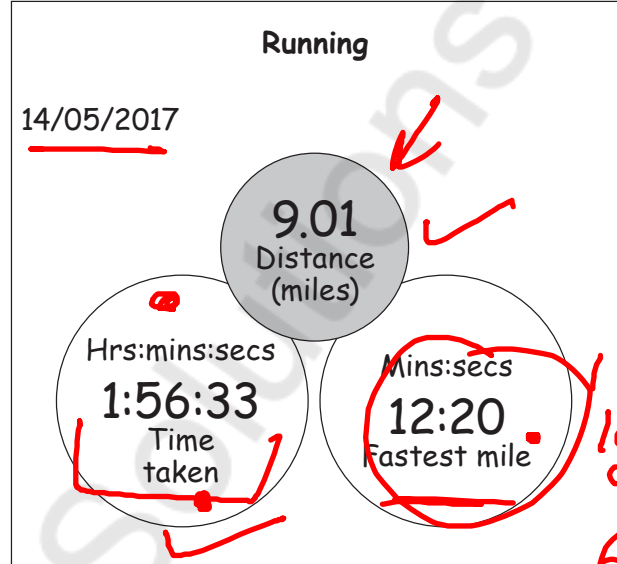
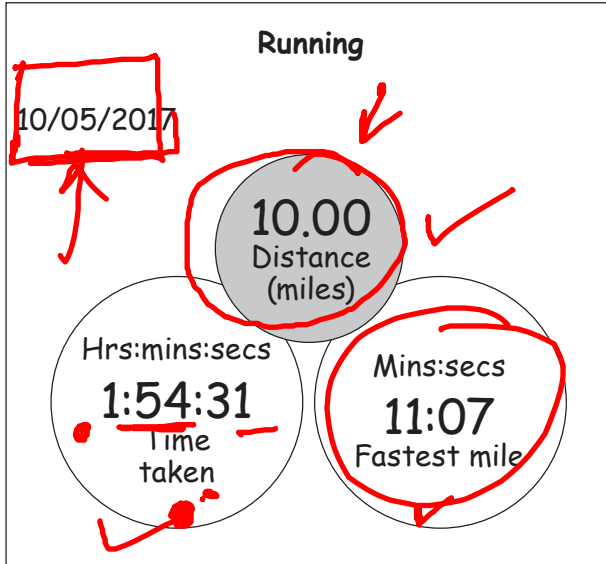
$$1 \text{ biscuit} = 9 \text{ p}$$

$$\text{So for } 200 \text{ biscuits} = 9 \times 200 = \underline{\underline{1800 \text{ p}}}$$

$$1800 \text{ p} = \text{£ } 18$$



3. Jo is a keen runner.
She tracks each of her runs using an app on her phone.
Information about her last four runs is shown below.



18

10.00
9.01
6.20
3.00

28.21

- (a) In Jo's last four runs,

(i) what was the shortest distance that she ran? [1]

Shortest distance = 3 miles

(ii) what was the longest time that she ran for? [1]

Longest time = 1 hour, 56 mins, 33 secs



- (b) Circle either TRUE or FALSE for each of the following statements about Jo's **last 4 runs**. [2]

Jo <u>always</u> ran for more than half an hour	TRUE	<u>FALSE</u>
Jo ran a total of more than 25 miles	<u>TRUE</u>	FALSE
Jo's <u>fastest mile</u> run was under <u>10 minutes</u>	<u>TRUE</u>	FALSE
Jo's furthest run took the longest time	TRUE	<u>FALSE</u>

28.21mi

9.33mi

- (c) On the **10th May 2017**, Jo set a target time of 1 hour 45 minutes to complete her run. By how many minutes and seconds did Jo miss her target? [1]

On 10th May 2017

New target 1hr 45 mins

So, time taken on 10th of May 2017

1hr 54mins 31sec

1 : 44 : 31 6

— 1 : 45 : 00

0 : 09 : 31

0hr 9mins 31sec

9mins 31sec

9:31



4. Mrs Henry works part time in a factory.
The amount of time for each day that she worked last week is shown in the table.

Day	Hours worked
Tuesday	$3\frac{1}{2}$ -
Wednesday	4 ✓
Thursday	$4\frac{1}{2}$ ✓
Friday	5 ✓
Saturday	3 ✓

Mrs Henry's pay is calculated using the following:

- Tuesday to Friday:
- £8 per hour for the first 15 hours
 - £9 per hour for any extra hours
- Saturday:
- double the usual rate of £8 per hour

- (a) In this part of the question, you will be assessed on the quality of your organisation, communication and accuracy in writing.

Work out Mrs Henry's total pay for last week.
You must show all your working.

[6 + 2 OCW]

Tuesday to Friday → £8 / hour 15 hours
→ £9 / hour After 15 hours

Saturday → £16 / hour

Last week: Total hours work between Tue to Friday

$$\text{Total hours} = 3.5 + 4 + 4.5 + 5 = 17 \text{ hours}$$

The first 15 hours is £8 / hour

$$\text{Total pay for first 15 hours} = 15 \times 8 = \underline{\underline{£120}}$$

The extra 2 hours is £9 / hour

$$\text{Extra 2 hours pay} = 9 \times 2 = \underline{\underline{£18}}$$

Total hours work on Saturday = 3 hours

Pay on Saturday is £16 / hour

$$\text{Total pay on Saturday} = 16 \times 3 = \underline{\underline{£48}}$$

$$\text{Total Pay for week} = 120 + 18 + 48$$

$$= \underline{\underline{£186}}$$



(b) On another week Mrs Henry was paid £188.

She puts 20% of her weekly wage into a savings account.

How much did Mrs Henry put into her savings account that week?
Circle your answer.

[1]

£9.40

£18.80

£34.20

£37.60

£150.40

Another week pay = £188

20% of weekly pay

20% of 188

$$\frac{188}{5} \times 188$$

$$= \frac{188}{5}$$

$$= £37.60$$

$$\begin{array}{r} 37.6 \\ \sqrt{188} \\ \underline{-15} \\ 38 \\ \underline{-35} \\ 30 \\ \underline{-30} \\ 0 \end{array}$$

3310U101
09

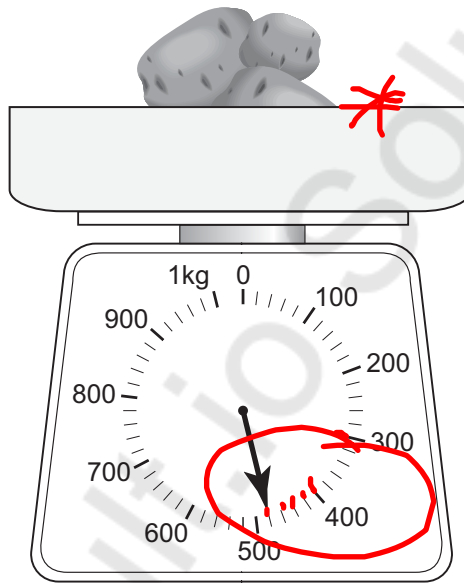
5.



Huw is going to make vegetable soup for 6 people.

A recipe for 2 people uses 10 ounces of potatoes.

He has placed some potatoes on his weighing scales as shown below.



The weighing scales display the mass in grams.

Huw knows that 1 ounce is approximately 28 grams.

How many more grams of potatoes does Huw need to make vegetable soup for 6 people? [5]

Handwritten calculations on the left margin:

$$\begin{array}{r} 30 \\ 28 \\ \hline 240 \\ 60 \\ \hline 840 \end{array}$$

$$\begin{array}{r} 71 \\ 840 \\ 480 \\ \hline 360 \end{array}$$

1 ounce \rightarrow 28 grams

6 people \rightarrow

2 people \rightarrow 10 ounces

6 people \rightarrow $10 \times 3 \rightarrow$ 30 ounces

1 ounce \rightarrow 28 grams

30 ounces \rightarrow $30 \times 28 \rightarrow$ 840 grams

Extra mass of potatoes needed is 360 grams

Scale ready \rightarrow 480 grams

He needs \rightarrow $840 - 480 =$ 360g



6. Siân wrote the following:

'For the last 7 days I have recorded the number of cars parked in my local car park at 10 a.m. each day. This is what I found.

- The car park always had some cars parked in it. ✓
- The greatest number of cars was 11. ✓
- The range was 8 cars. ✓
- The median was 9 cars. ✓
- The mode was 10 cars. ✓
- On one day, there were 6 cars in the car park. ✓
- On another day, there were 7 cars in the car park. ✓

Gareth asked,

'What was the mean number of cars in the car park at 10 a.m. for these 7 days?'

Complete Siân's reply to Gareth's question.

You must list the 7 numbers Siân recorded and show all your working.

'The mean number of cars in the car park at 10 a.m. for these 7 days was

eight cars: 3 6 7 9 10 10 11 ✓

Analysis

One of the days → 6 cars

One of the days → 7 cars

One of the days → 9 cars

One of the days → 11 cars

Since Range = 8 ; Highest No - Lowest No = 8
 $11 - 3 = 8$

One of the days → 3 cars

Two of the days → 10 cars

3, 6, 7, 9, 10, 10, 11

$$\begin{array}{r} 31 \\ 25 \\ \hline 56 \end{array} \text{ mean} = \frac{\sum fx}{\sum f} = \frac{3 + 6 + 7 + 9 + 10 + 10 + 11}{7}$$

$$= \frac{56}{7} = 8 \text{ cars}$$

$$\text{mean} = 8 \text{ cars}$$

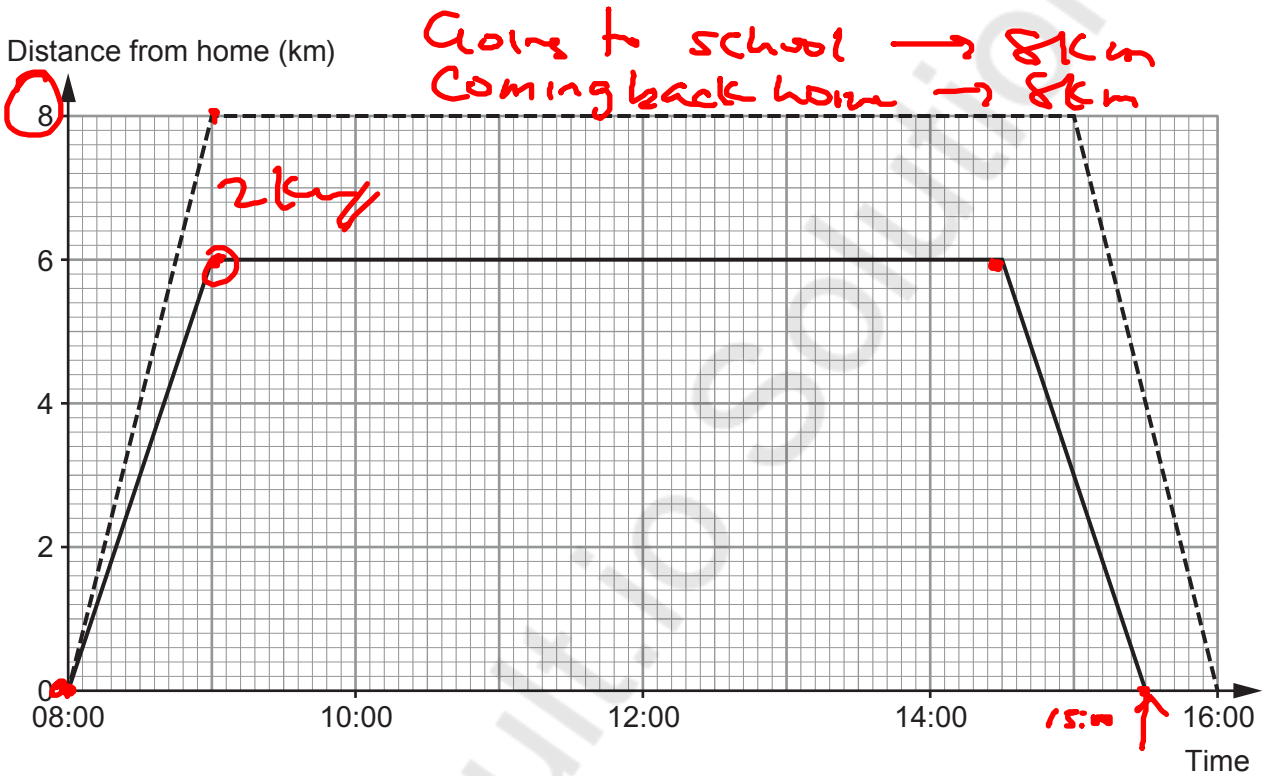


7. Eleri and Yvon are sisters.
 They both live at *Cwm Uchel*.
 They do not go to the same school.
 The graph represents each of their journeys to school and back.

Key:

----- represents Eleri's journeys

————— represents Yvon's journeys



(a) At what time did Yvon arrive home from school?
 Circle your answer.

[1]

14:45

15:15

15:30

15:45

16:00



- (b) Eleri cycles along a straight road to school and back.
How far does she cycle when going to school and back in one day?
Circle your answer.

[1]

6 km

8 km

9 km

12 km

16 km

1 8 km + 8 km to and fro
16 km

- (c) Martha looks at the graph and says,

'The school Eleri attends is 2 km from Yvon's school.'

Is this true?

Certainly true

Certainly false

Can't tell


Give a reason for your answer.

[1]


The distance given in the question
is distance from home and not distance
between the school



8.



Maes Alun Camping Charges



Tents covering ground area:

- less than or equal to 12m² cost £14 per night
- greater than 12m² cost £16 per night

AND

Charge per person: £4 per night

Stay 5 nights and get the next night completely free. *
This means no charge for tents or people on every 6th night. *

Rhodri and Lars are planning a camping holiday, staying at *Maes Alun Camping*. They are going to:

- take only one tent between them,
- take a tent covering a rectangular ground area, measuring 2.5 metres by 4.4 metres,
- both stay for a total of 12 nights.

Their holiday is just 8 weeks away.

They **each** plan to save £15 per week from now until their holiday in 8 weeks' time.

Will the amount they save be enough to pay for their holiday?
You must show all your working.

15
x 8

120

14
12

28
14

168
-24

144

2.5 x 4.4 = 11m²

15 x 8 = 120

120 x 2 = 240

[8]

Number of tent → 1

Area of tent is 2.5m by 4.4m : A = L x W

A = 2.5 x 4.4 = 11m²

Total time spent is 12 night.

Savings: Each plan to save £15 / week

Total savings for 8 weeks = 15 x 8 = £120

Total saving for both of them = 120 x 2 = £240

Cost of Holiday

Tent they are getting is £14 / night

Total Cost of tent for 12 day is = 14 x 12

£168



Since there are 2 6th night then, we need to remove $2 \times 14 = 28$ from the tent cost

15

Examiner
only

$$\text{Tent cost} = £168 - £28 = £140$$

Each person is charge £4/night

So, the two friends will charge £8/night

So, out of 12 days, 2 days is free

$$\text{So, Total cost for the two friend} = 8 \times 10 = £80$$

$$\text{Total cost of the holiday} = 140 + 80$$

$$= £220$$

$$\begin{array}{r} 140 \\ 80 \\ \hline 220 \end{array}$$

$$\text{They saved} = £240$$

The amount they saved will be enough for the holiday since the

$$£240 > £220$$

savings is greater than the holiday cost by £20



9. Kari is making a jigsaw puzzle. She has designed the pattern on a piece of paper. Kari plans to make each piece of the jigsaw a different colour.

Part of her plan is shown below.

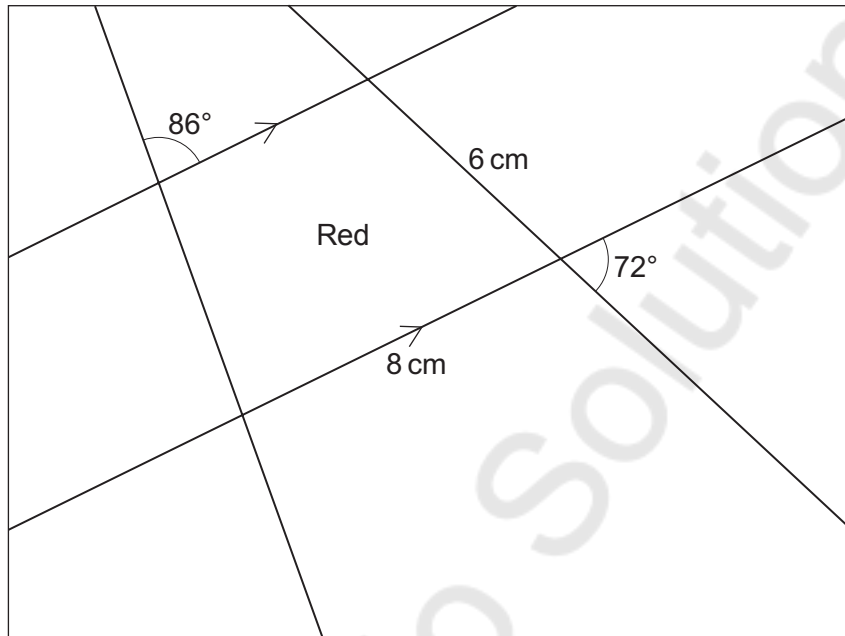


Diagram not drawn to scale

Kari now sketches a diagram of the red piece of the jigsaw, which is shown below. She shows some extended lines and indicates all the angles she needs to find.

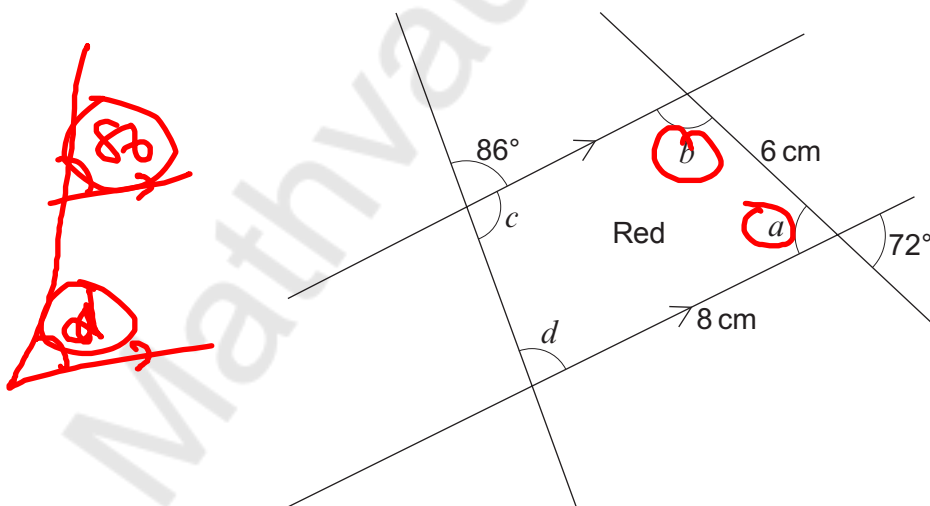


Diagram not drawn to scale

$$\begin{array}{r}
 180 \\
 - 86 \\
 \hline
 94
 \end{array}$$



$$c + 86 = 180 \quad [\text{sum of angle on a straight line}]$$

$$c = 180 - 86 = 94^\circ$$

17

Examiner
only

Find the 4 missing angles in the red piece of the jigsaw.

Draw the red piece of Kari's jigsaw accurately.

One side has been drawn for you.

[6]

$$a = 72^\circ \quad [\text{vertical opposite angle}]$$

$$d = 86^\circ \quad [\text{corresponding angle}]$$

$$a + b = 180^\circ \quad [\text{sum of interior angle in a transversal line}]$$

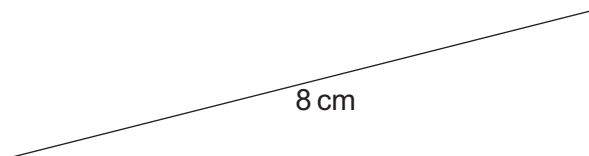
$$b = 180 - a = 180 - 72 = 108^\circ$$

$$a = 72^\circ, \quad b = 108^\circ, \quad c = 94^\circ, \quad d = 86^\circ$$

$$\begin{array}{r} 180 \\ - 72 \\ \hline 108 \end{array}$$

Space for drawing the red piece of jigsaw:

Protractor Ruler



10. Lazar wants to send a package to Germany. He looks at pricing charts for three different companies, ParcelMax, DirectGo and Pack2save.

ParcelMax	Total cost =	<u>Sum of the 3 dimensions in cm</u> × £0.60
DirectGo	Total cost =	<u>Volume measured in cm³</u> × £0.01
Pack2save	Total cost =	<u>Total area of all 6 faces measured in cm²</u> × £0.02

Lazar's parcel is a cuboid measuring 10 cm by 20 cm by 30 cm.

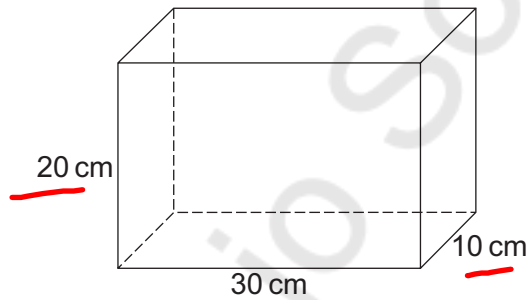


Diagram not drawn to scale

Handwritten calculations:

$$60 \times 0.60$$

$$60 \times 60$$

$$\frac{60 \times 60}{100}$$

Find the cost of sending the parcel for each of the three different companies. Give each of your answers in pounds (£).

(a) ParcelMax

[2]

Handwritten solution for ParcelMax:

$$\text{Cost} = \text{sum of 3 dimensions} \times 0.60$$

$$(10 + 20 + 30) \times 0.60$$

$$60 \times 0.60$$

$$= \text{£}36$$

(b) DirectGo

Handwritten formula: $V = L \times W \times H$

[3]

Handwritten solution for DirectGo:

$$\text{Cost} = \text{Volume} \times 0.01$$

$$\text{Cost} = L \times W \times H \times 0.01$$

$$= 30 \times 10 \times 20 \times 0.01$$

$$= 30 \times 10 \times 20 \times \frac{1}{100} = \text{£}60$$



$$\text{Dimension} = L \times W \times H$$

$$= 10 \times 20 \times 30$$

$$\text{TSA} = 2[LW + LH + WH]$$

(c) Pack2save

$$W=B$$

[4]

$$\text{Cost} = \text{Total Surface Area} \times 0.02$$

$$\text{Cost} = 2[LW + LH + WH] \times 0.02$$

$$\text{Cost} = 2[10 \times 20 + 10 \times 30 + 20 \times 30] \times 0.02$$

$$\text{Cost} = 2[200 + 300 + 600] \times \frac{2}{100}$$

$$\text{Cost} = 2 \times 1100 \times \frac{2}{100} = 44$$

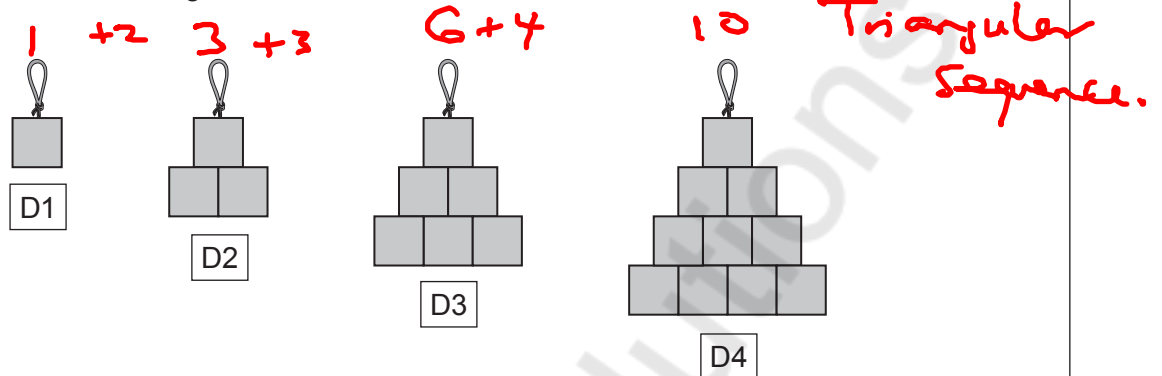
$$\text{Cost} = \underline{\underline{£ 44}}$$



11. Ollie has a job in a workshop that makes decorations.

He makes decorations using small squares of stained glass.

Ollie has made the following decorations.



He labels the first decoration D1.
He labels the next 3 decorations in order, D2, D3 and D4.

He continues to make decorations and labels following this pattern.

- (a) After making decoration D5, Ollie notices he only has 10 small squares of stained glass left.
How many **more** squares of stained glass will Ollie need to make decoration D6? [2]

1, 3, 6, 10, 15, 21
 D1, D2, D3, D4, D5, D6
 So, he will need $21 - 10 = 11$ small squares
11 more small squares

- (b) Ollie uses a rule to work out how many squares he needs for each decoration.
He states that to make decoration D10 he would need 55 squares.
Is Ollie correct?
You must show your working. [1]

D10 → 55 squares
 1⁺² 3⁺³ 6⁺⁴ 10⁺⁵ 15⁺⁶ 21⁺⁷ 28⁺⁸ 36⁺⁹ 45⁺¹⁰ 55
 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10
 So, Ollie is correct, since D10 gives 55 squares, so, he need 55 squares to make D10
 END OF PAPER ✓



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