Surname	Centre Number	Candidate Number
First name(s)		0

GCSE

3310U10-1

A21-3310U10-1

TUESDAY, 2 NOVEMBER 2021 – MORNING

MATHEMATICS – NUMERACY
UNIT 1: NON-CALCULATOR
FOUNDATION TIER

1 hour 25 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 additional page at the back of the booklet. Question numbers must be given for the work written on the additional page.

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 **3***(b)*, 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.	**5**	
2.	**11**	
3.	**11**	
4.	**5**	
5.	**3**	
6.	**6**	
7.	**6**	
8.	**7**	
9.	**6**	
Total	**60**	

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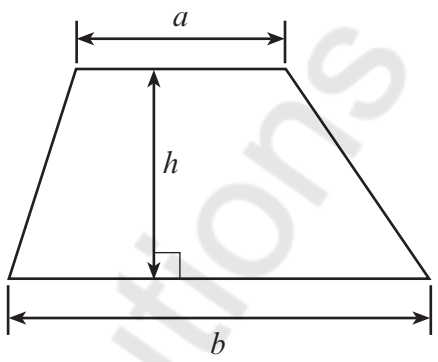
Formula List – Foundation Tier

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



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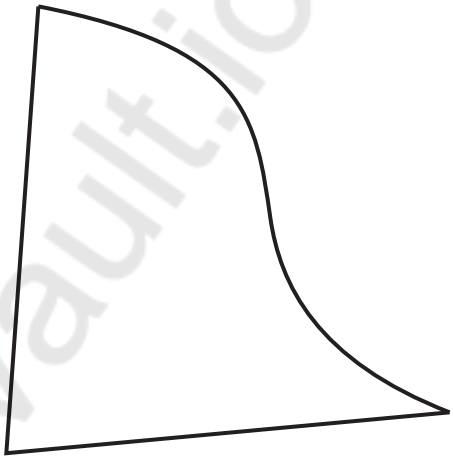
1. *Amazing Snacks* makes tortilla chips, as shown in this picture.

(a) This tortilla chip has 3 sides of equal length.
What is the name of a triangle that has 3 sides of equal length?
Circle your answer. [1]

scalene isosceles right-angled equilateral quadrilateral

(b) Maisie has been asked to design a new shape of chip.
One of her designs is shown below.



Maisie thinks that the angle between the two straight edges is an obtuse angle.
Do you agree?
You must use the diagram to give a reason for your answer. [1]

Yes ☐ No ☑

No, because an obtuse angle is over 90° & this one is below 90°

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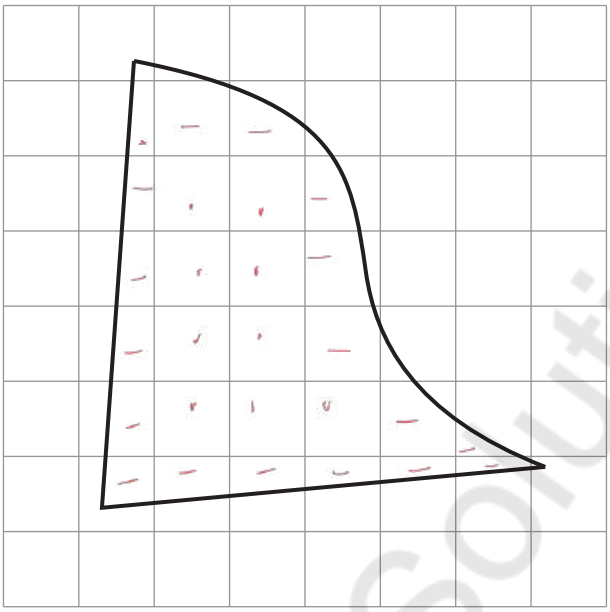
(c) Maisie's design is shown on the centimetre-squared grid below.



The face of one of the original chips has an area of 13 cm^2.

Maisie thinks her new design has a greater area than the original.

Decide whether or not Maisie is correct.
You must show all your working. [3]

9 full squares + 18 half squares
9 + 9 = 18 cm^2
18 cm^3 is > 13 cm^2
So, Maisie is correct. Her new design has a greater area

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2. The table below shows the number of swimming medals won by 5 countries in the 2018 Gold Coast Commonwealth Games.

One entry is missing.

Country	Gold	Silver	Bronze	Total
England	9	10	5	24
South Africa	6	3	3	12
Canada	3	11	6	20
New Zealand	2	0	1	3
Wales	1	1	3	5

(a) (i) Complete the table to show the number of Silver medals won by Canada. [1]

Total = Gold + Silver + Bronze

20 = 3 + Silver + 6 => Silver = 20 − 3 − 6

= 11

(ii) Which country had a quarter of the total number of medals won by Canada? [1]

Canada's total medals = 20 => $\frac{1}{4}$ of their total medals = $\frac{1}{4} \times 20$

$\frac{1}{4} \times 20 = \frac{20}{4} = 5$ = Wales has a total of 5 medals.

(b) Draw a pictogram to represent the total number of medals won by each of the 5 countries. [4]

KEY: ⊞ to represent 4 medals

Country	
England	⊞ ⊞ ⊞ ⊞ ⊞ ⊞
South Africa	⊞ ⊞ ⊞
Canada	⊞ ⊞ ⊞ ⊞ ⊞
New Zealand	⊞
Wales	⊞ □

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(c) Before 2018, the world record for the 100 metres breaststroke was 57·13 seconds. During 2018, Adam Peaty beat this world record by 3 hundredths of a second. What was the new world record? [2]

$\frac{3}{100} = 0.03$

$57.13 - 0.03 = 57.10$ seconds

New world record = 57.10 seconds

(d) Alys Thomas, from Wales, won a Gold medal in the 200 metres butterfly final. Her reaction time was 0·73 seconds and her total time was 2 minutes and 5·45 seconds. The results for the race are shown below.

Results

Position	Lane	Name	Reaction time (in seconds)	Total time (in minutes and seconds)
1	4	WAL Alys THOMAS	0.73	2:05.45
2	5	AUS Laura TAYLOR	0.68	2:07.39
3	6	AUS Emma MCKEON	0.73	2:08.05
4	7	IOM Charlotte ATKINSON	0.70	2:08.50
5	2	AUS Brianna THROSSELL	0.68	2:08.82
6	3	CAN Mabel ZAVAROS	0.70	2:09.20
7	8	ENG Emily LARGE	0.68	2:10.96
8	1	ENG Laura STEPHENS	0.68	2:11.46

(i) What is the difference in the total time between 1st and 2nd place? [2]

Difference = 2:07.39 − 2:05.45

= 0:01.94

= 1.94 seconds

2:07.39
− 2:05.45
0:01.94

(ii) What was the modal reaction time? [1]

0.73 appears twice, 0.68 appears four times, 0.70 appears twice

Modal rxn time = 0.68 seconds

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3. Mona and Rob shop online and have their weekly shopping delivered to their house.

(a) One day, Mona writes the following shopping list and does not check the quantities.

Place a '×' by the items that do not appear to have a sensible quantity.
Place a '✓' by those that do.

One has been completed for you. [3]

Item	Quantity	× or ✓
Orange squash	1 litre	✓
A bag of apples	1 kilogram	✓
A bag of sugar	70 kilograms	×
A large bag of crisps	150 grams	✓
Milk	20 millilitres	×
A bag of rice	500 grams	✓
A bottle of shampoo	9 litres	×
A large bar of chocolate	200 kilograms	×

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

On another day, the cost of Mona's shopping is £84.
She has a voucher that gives 25% off this cost.

Mona then contacts the shop.
She is given the following **extra** information on delivery fees:

Cost of shopping **(after using any vouchers)**	Delivery fee
£40 to £49.99	£6
£50 to £59.99	£5
£60 to £69.99	£4
£70 to £79.99	£3
£80 to £89.99	£2
£90 or more	£1

What will be the total amount that Mona pays for her shopping, including the delivery fee?
You must show all your working. [4 + 2 OCW]

Discount = 25% off £84 = $\frac{25}{100} \times 84 = 0.25 \times 84 = £21$

Cost after voucher = Original cost − Discount
= 84 − 21
= £63 + £4 (delivery fee)
= £67

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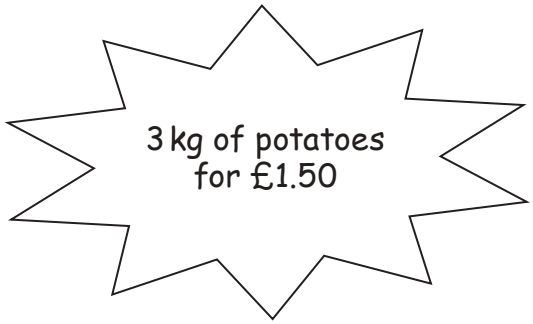
(c) Rob visits the local shops to buy potatoes.
He sees these two offers.



Explain fully which offer is the better buy.
You must include an appropriate calculation. [2]

Offer 1 = 3kg of potatoes for £1.50

Price per kg = $\frac{1.50}{3}$ = £0.50/kg ✓ (Better buy)

You're getting a greater weight of potatoes for the same amount of money

Offer 2 = 5lb of potatoes for £1.50

Convert pounds to kg = 1 pound = 0.453 kg

50 G pounds = 5 × 0.453 kg = 2.27kg

Price per kg = $\frac{£1.50}{2.27}$ = £0.66/kg

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4.

The prices for cupcakes at two different bakeries are shown below.

Carol's Cakes
2 cupcakes for £5.00

Icing Top Cakes
3 cupcakes for £8.40

For a birthday party, Maldwyn needs 12 cupcakes.

How much will Maldwyn save by buying the 12 cupcakes from *Carol's Cakes* rather than from *Icing Top Cakes*?
You must show all your working. [5]

Carol's cakes:
Cost of 2 cupcakes = £5.00 ; cost of 1 = $\frac{5.00}{2}$ = £2.50
Cost of 12 cupcakes = £2.50 × 12 = £30.00

Icing Top cakes:
Cost of 3 cupcakes = £8.40 ; Cost of 1 = $\frac{8.40}{3}$ = £2.80
cost of 12 cupcakes = £2.80 × 12 = 33.60

Savings = Cost (Icing top cakes) − Cost (Carol's cakes)
= £33.60 − £30.00 = £3.60 //

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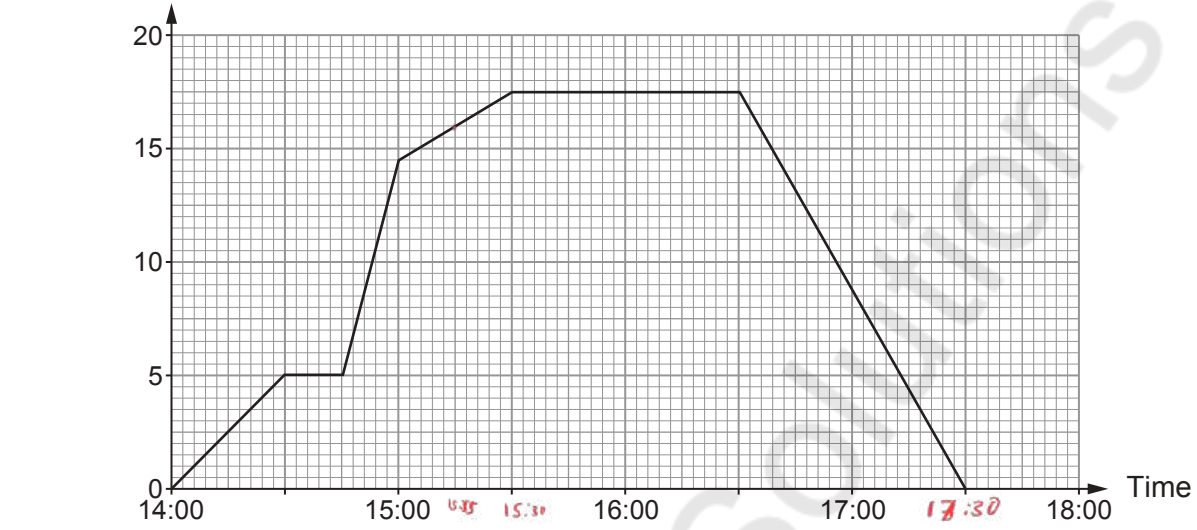
5. Dean went to the gym yesterday afternoon.
The graph shows the distance Dean was from home during yesterday afternoon.



(a) How far away from home was Dean at 15:15?
Circle your answer. [1]

15·5 km 15 km 16·5 km 16 km 17 km

(b) At what time did Dean arrive back home?
Circle your answer. [1]

5:30 p.m. 5:30 a.m. 5:15 p.m. 5:10 p.m. 5:00 a.m.

(c) Circle the term below that best completes the statement. [1]

"Looking at the travel graph, it is ..... that Dean stopped for more than ten minutes on the way to the gym."

very unlikely unlikely impossible

an even chance very likely

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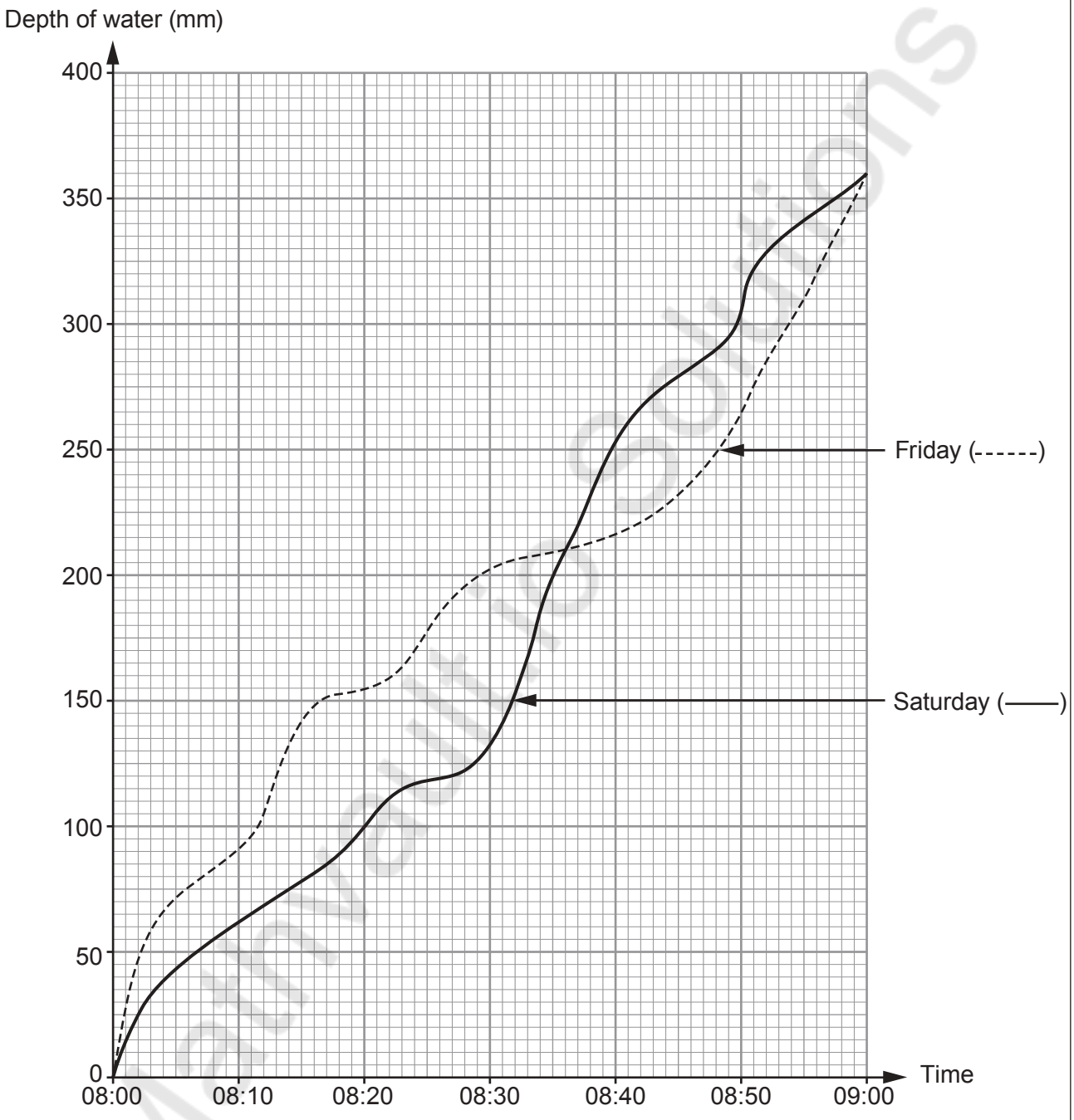
6. A water tank is filled every morning.
The graph below shows the depth of water in the tank between 8:00 a.m. and 9:00 a.m. on Friday and Saturday.



(a) What was the difference between the depth of water on Friday and on Saturday at 8:20 a.m.? [2]

54 or 55mm

.....

.....

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(b) On both days, the tank filled with water to a depth of 360 mm.
On which day did this happen more quickly?

Friday ☐ Saturday ☐ The same for both days ☑

You must give a reason for your answer. [1]

Both were full at 9am, basically at the same time.

(c) Consider the time interval between 8:10 a.m. and 8:50 a.m.
At what time was the depth of the water in the tank the same on both Friday and Saturday? [1]

8:36am

(d) On which day did the water tank fill more quickly between 8:30 a.m. and 8:40 a.m.?

Friday ☐ Saturday ☑ Can't tell ☐

You must give a reason for your answer. [1]

Gradient is more

(e) The tank can hold water to a depth of 400 mm.
On Saturday, at what time was the water in the tank **half** this depth? [1]

8:28 a.m. 8:20 a.m. (8:35 a.m.) 8:12 a.m. 8:30 a.m.

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7. *(a)* The following advertisement appeared in the *Draig Newsletter*.

Mr Chen's guitar lessons.

A single lesson costs £23.

Pay in advance for 5 lessons and get 15% off the cost of these 5 lessons.

Rowena has a guitar lesson with Mr Chen.
She then decides to pay in advance for a further 5 lessons.

How much does Rowena pay in total for these 6 guitar lessons? [4]

Cost of first lesson = £23

Original cost of 5 lessons = £23 × 5 = 115

Discount = $\frac{15}{100}$ × 115 = 0·15 × 115 = £17·25

Cost of 5 lessons after discount = £115 − £17·25
= £97·75

Total cost = Cost of first lesson + Cost of 5 lessons after discount
= £23 + 97·75 = £120·75

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(b) Dafydd wants to learn to play the saxophone.

Saxophone lessons will cost him a total of £300.
He needs to pay a deposit of £18 to book the lessons.

What percentage of the total cost of the lessons is the deposit? [2]

Deposit = £18

Total cost = £300

Percentage = $\frac{\text{Deposit}}{\text{Total cost}} \times 100$

$= \frac{18}{300} \times 100 = 6\%$

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8. Three different stores sell bananas.

Store	Price of bananas
FruitCo	12 bananas for £1
Quick Fruit	4p per 50 g
Bach Market	85 pence per kg

You can assume that the mass of a banana in each of the stores is 100 g.

Sid needs to buy 24 bananas.

Calculate how much Sid would pay in each of the stores.
In which store will he be able to get 24 bananas for the least amount of money?
You must show all your working. [7]

Fruitco: Cost of 12 bananas = £1 ; Cost of one = $\frac{1}{12}$ = 0.0833

Cost of 24 bananas = 0.0833 × 24 = £2.00

Quick fruits: Mass of 1 banana = 100g ; mass of 24 bananas = 24 × 100g

= 2400g = 2.4kg

Cost per 50g = 4P ; cost per gram = $\frac{4P}{50g}$ = 0.08p/g

Cost of 2400g = 2400g × 0.08p/g = 192p = £1.92

Bach market = Mass of 24 = 24 × 100g = 2400g = 2.4kg

Cost per kg = 85p ; Cost per 2.4kg = $\frac{2.4}{85}$ = 204P

= £2.04

Sid would pay the least amount of money at Quick fruit

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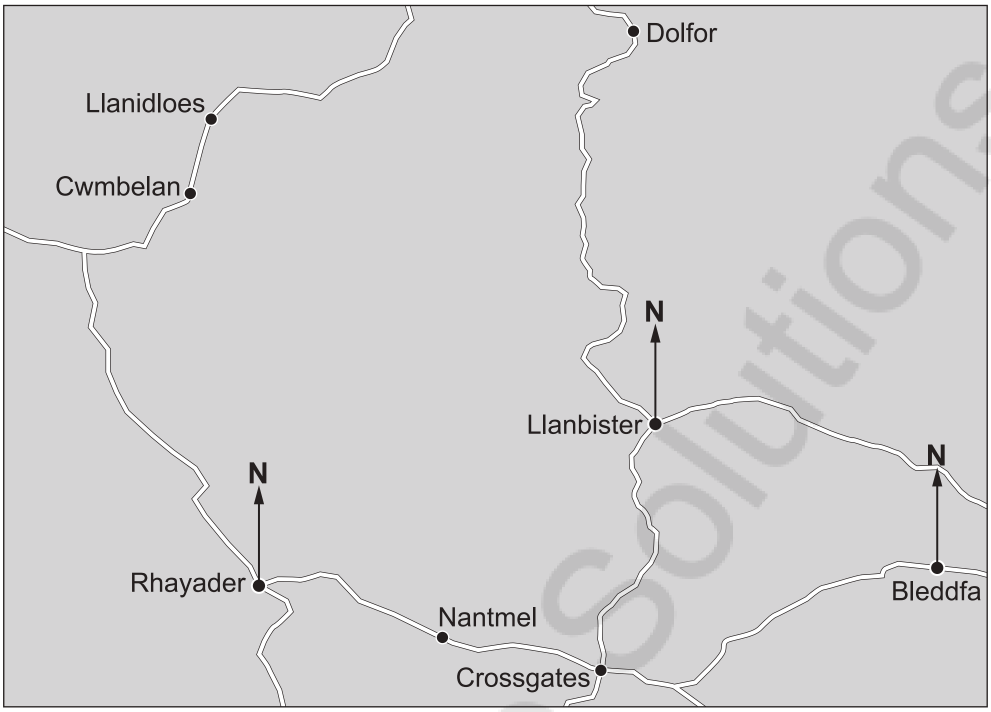
9. Use this section of a map of Wales to answer this question.
The map is drawn to scale.



(a) Complete each of the following statements.

(i) 'The bearing of Llanbister from Rhayader is 068 ± 2°.' [1]

(ii) 'The bearing of Bleddfa from Llanbister is 117 ± 2°.' [1]

(b) Cwmbelan is 2 miles from Llanidloes.

Sioned travelled from Rhayader to Crossgates in 30 minutes.
Calculate her approximate average speed.
Give your answer in miles per hour (mph).
You must show all your working. [4]

8 miles to 12 miles

Average speed $= \frac{8 \text{ to } 12}{0.5} = \frac{8}{0.5}$ to $\frac{12}{0.5}$

$=$ 16 to 24 mph

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Question number	Additional page, if required. Write the question number(s) in the left-hand margin.

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