NUMERACY INTERMEDIATE REVISION BOOKLET 2

NOV 2019

Name: .....

Teacher: .....

Time and Travel Graphs

F+I Num Nov 2017 Q2 7

Examiner only

(ii) What fraction of the pupils said that blue was their favourite colour? Give your answer in its simplest form. [3]

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4. *(a)* What is 3 hours 12 minutes in hours? Circle your answer. [1]

3·102 hours 3·12 hours 3·15 hours 3·2 hours 3·25 hours

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(b) The first 40 miles of a journey took 1 hour 15 minutes. The remaining 80 miles were completed in 2 hours 15 minutes. Calculate the average speed, in mph, of the 120-mile journey. [3]

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3310U401
07

F+I Maths Num U1 Nov 2016

Examiner only

7. When it is 21:30 on a Tuesday in London, it is 02:30 on a Wednesday in Dhaka, Bangladesh.

It takes 10 hours 30 minutes to fly from Dhaka to London.
A flight leaves Dhaka on Thursday at 13:00 local Dhaka time.

On what day and at what time should this flight arrive in London?
Give your answer in local London time. [4]

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Arrival in London:

Day ..... Time .....

U498 2

F Maths Num U2 Nov 2016

Examiner only

4. Jane lives in Cardiff and plans to travel to Bangor.

(a) Jane thinks about catching the train.

TRAIN TIMES: CARDIFF TO HOLYHEAD

Cardiff Central	05:10	07:21	09:21
Hereford	06:25	08:27	10:27
Chester	08:19	10:19	12:19
Bangor	09:33	11:38	13:28
Holyhead	10:22	12:22	14:22

Jane wants to arrive at Bangor before 1 p.m.
She could catch the 07:21 train from Cardiff Central.
How long would the train journey to Bangor take? [1]

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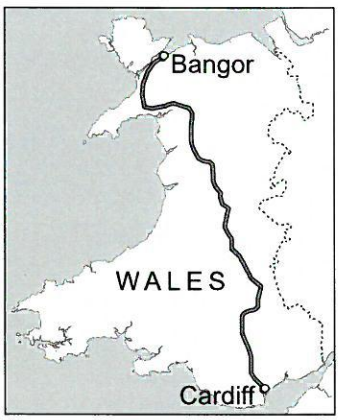
(b) Jane decides to drive to Bangor.



Cardiff to Bangor
JOURNEY DETAILS

Distance 200 miles
Time (normal traffic) 4 hours 30 minutes

(i) Jane knows that her car travels 50 miles on one gallon of petrol.
The cost of petrol is £5.90 per gallon.
How much will the petrol cost for Jane to drive from her home to Bangor?
You must show all your working. [2]

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Examiner only

(ii) Jane needs to take a break after every 1 hour 15 minutes of driving.
How many breaks will she need to take before reaching Bangor? [1]

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(iii) Jane decides to allow five and a half hours for the whole journey.
She needs to arrive in Bangor by 1 p.m.
What is the latest time she should leave Cardiff? [1]

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60 4

Examiner only

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.

Running

10/05/2017

10.00 Distance (miles)

Hrs:mins:secs 1:54:31 Time taken

Mins:secs 11:07 Fastest mile

Running

14/05/2017

9.01 Distance (miles)

Hrs:mins:secs 1:56:33 Time taken

Mins:secs 12:20 Fastest mile

Running

19/05/2017

6.20 Distance (miles)

Hrs:mins:secs 1:11:51 Time taken

Mins:secs 11:10 Fastest mile

Running

21/05/2017

3.00 Distance (miles)

Hrs:mins:secs 0:29:42 Time taken

Mins:secs 9:33 Fastest mile

(a) In Jo's last four runs,

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

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

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5

Examiner only

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

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

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(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]

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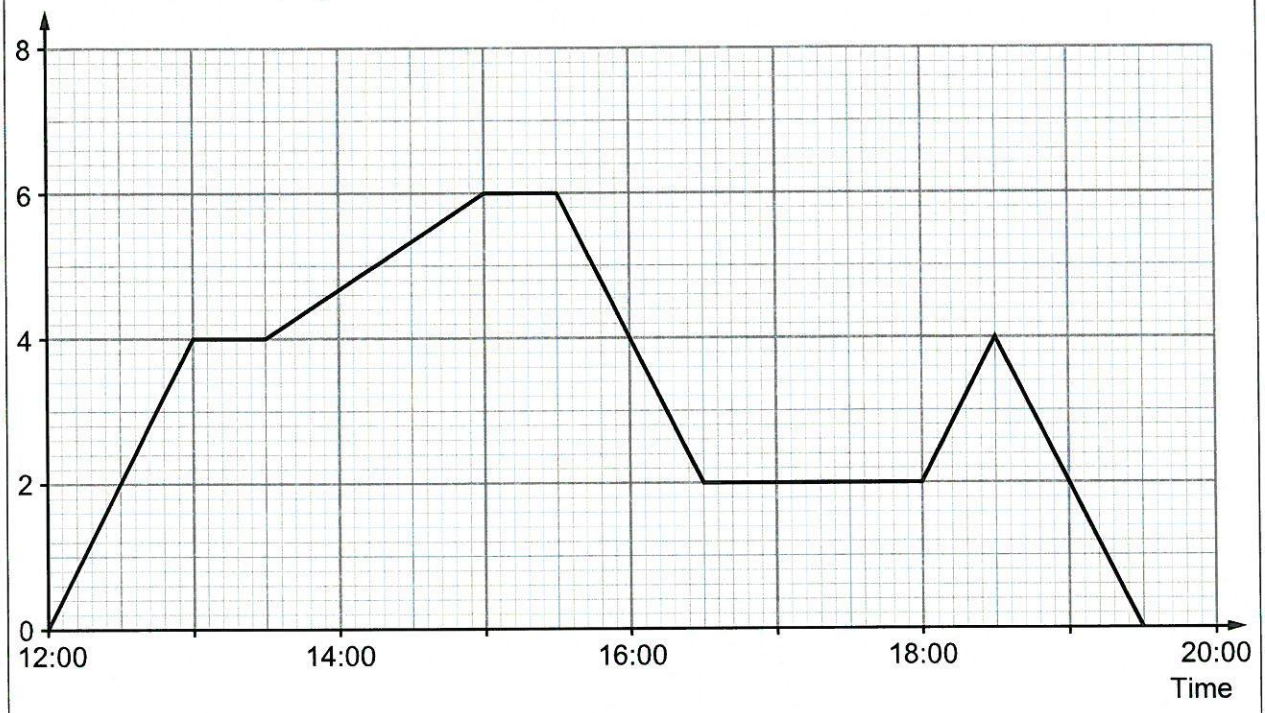
F+I Maths Num U2 Nov 2016

Examiner only

1. The travel graph below shows a journey Gareth made yesterday.



(a) How far away from home was Gareth at 15:00?
Circle your answer. [1]

0 km 2 km 4 km 6 km 8 km

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

14:00 16:30 18:45 19:15 19:30

(c) Sometime after 5p.m., Gareth went to the supermarket.
The supermarket was closed when he got there so he went straight back home.
At what time did Gareth arrive at the supermarket?
Circle your answer. [1]

17:00 17:30 18:00 18:15 18:30 19:00

(d) Gareth did not stop for the whole of the time between 15:00 and 15:30.
What could the travel graph tell you about his journey between these times? [1]

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03

SBa 7

F+I Maths Num U2 3 June 2017

Examiner only

1.

Bus timetable from Orme Station to Outlet Village

Only 55 minutes from Orme Station direct to Outlet Village.

Buses leave the station
- every 12 minutes from 8 a.m. until 12 noon
- every 24 minutes from 12 noon until 10 p.m.

(a) At what time does the first bus after 09:00 leave Orme Station?
Circle your answer. [1]

09:05 09:12 09:18 09:24 09:30

(b) Gwil looks at the timetable shown above.
He decides to take the latest possible bus to be at Outlet Village by 15:00.

At what time will Gwil arrive at Outlet Village?
You must show all your working. [2]

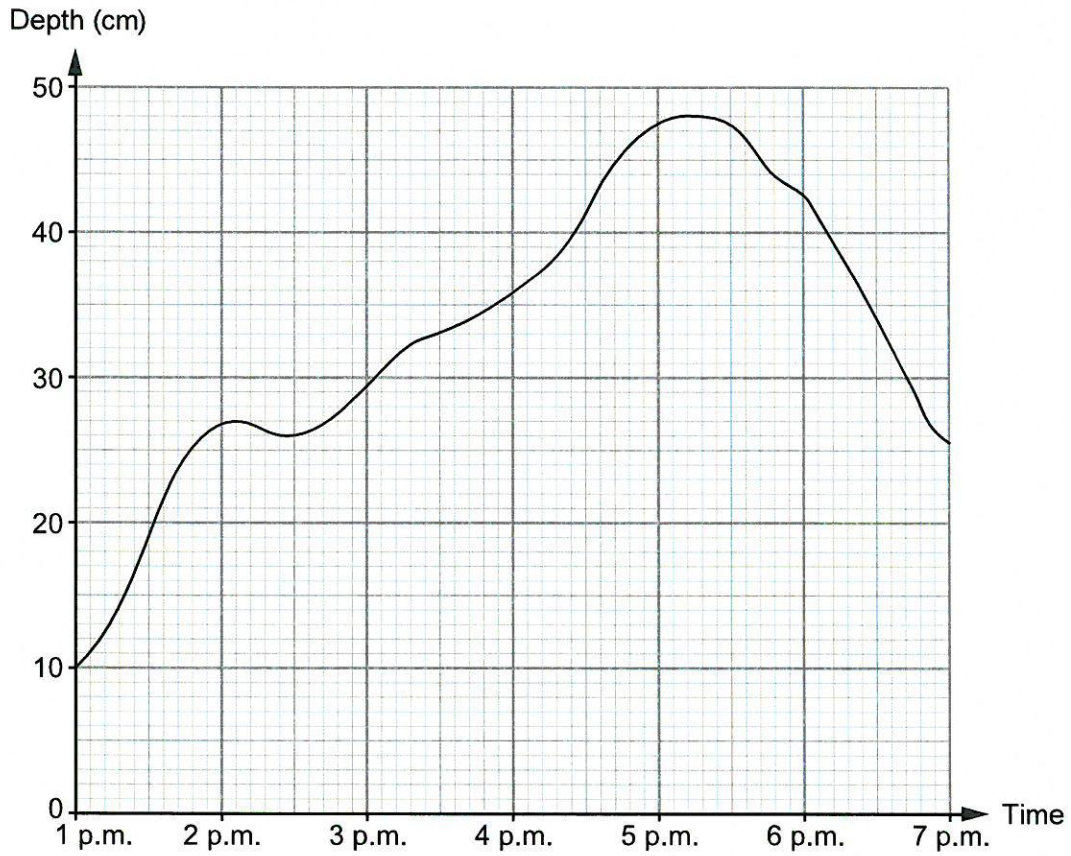
3310U401
03

34 8

F+I Num June 2018 4?

Examiner only

4. Carys has to write a report on the water levels of the River Tad.
She has recorded the depth of the water in the River Tad between 1 p.m. and 7 p.m.
This is shown in her graph below.



(a) What was the greatest recorded depth of water in the river?
Circle your answer. [1]

26 cm 27 cm 46 cm 48 cm 50 cm

55 9

F+I Num June 2018 H2

Examiner only

(b) In which of these 15-minute periods was the depth of water increasing most rapidly? Circle your answer. [1]

1:15 p.m. to 1:30 p.m. 4:15 p.m. to 4:30 p.m. 5:00 p.m. to 5:15 p.m.

6:00 p.m. to 6:15 p.m. 6:15 p.m. to 6:30 p.m.

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(c) Carys looks at the part of the graph for the period 6 p.m. to 7 p.m. Describe what this tells her about the river. [1]

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(d) For what period of time was the depth of water in the river greater than 45 cm? Circle your answer. [1]

48 minutes 1 hour 1 hour 12 minutes

1 hour 24 minutes 1 hour 30 minutes

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3310U401 07

56 10

Examiner only

4. *(a)* The towns of Aberglen, Bargwyn, Caerlow and Derwen are on Bus Route 3.
The times buses take to travel between each of the towns are shown on the diagram below.

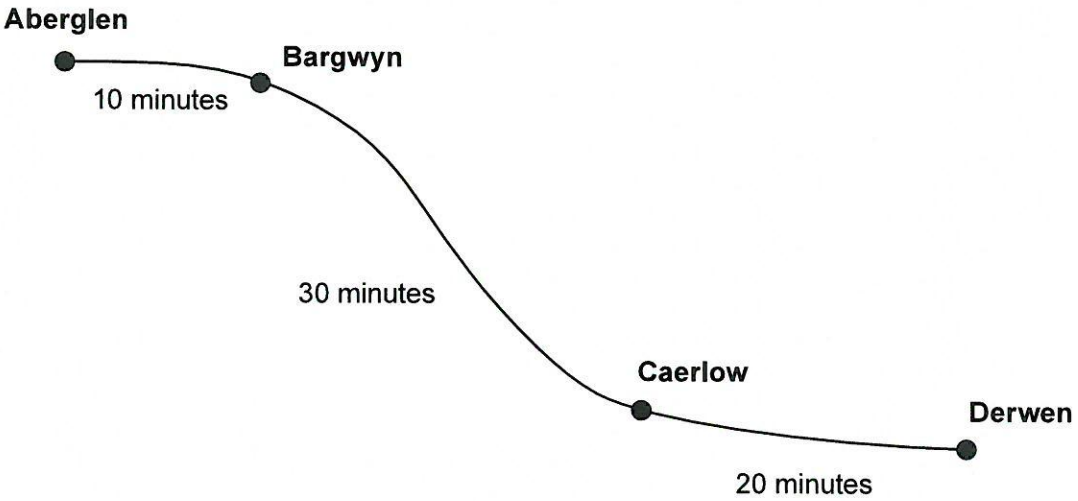

Diagram not drawn to scale

Buses start at Aberglen.
All these buses travel to Derwen, stopping at Bargwyn and Caerlow.

Here is the bus timetable.

Departing from:	Times
Aberglen	First bus leaves at 09:00, then every 13 minutes after this time.

(i) At what time does the 09:13 bus from Aberglen arrive at Derwen?
Circle your answer. [1]

09:23 09:33 09:43 10:53 10:13

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(ii) Dilys arrives at the bus stop in Bargwyn at 09:30.
At what time is the next bus?
Circle your answer. [1]

09:32 09:36 09:39 09:49 09:52

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F+I June 2015 Num U1

Examiner only

(b) From Grainsey, the Number 6 bus runs to Wyndre and the Number 7 bus runs to Hafgoch.

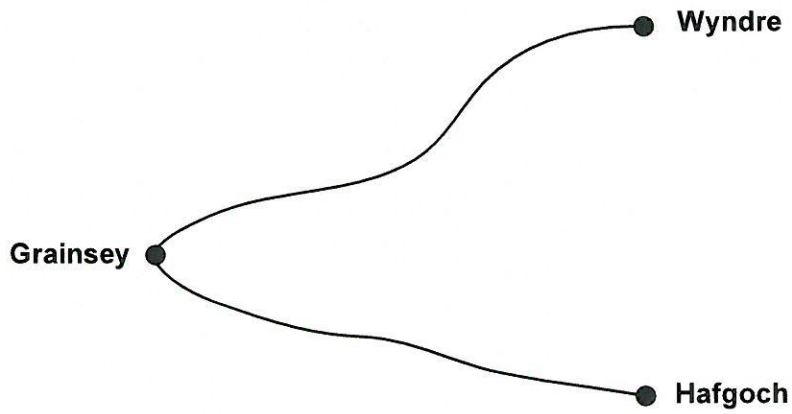


Diagram not drawn to scale

The timetable for these buses is given below:

Bus Number	To	Times
6	Wyndre	First bus leaves at 10:00, then every 20 minutes after this time.
7	Hafgoch	First bus leaves at 10:00, then every 45 minutes after this time.

After 10:00, when will the Number 6 bus and the Number 7 bus next leave Grainsey at the same time? [4]

~~56~~ 12

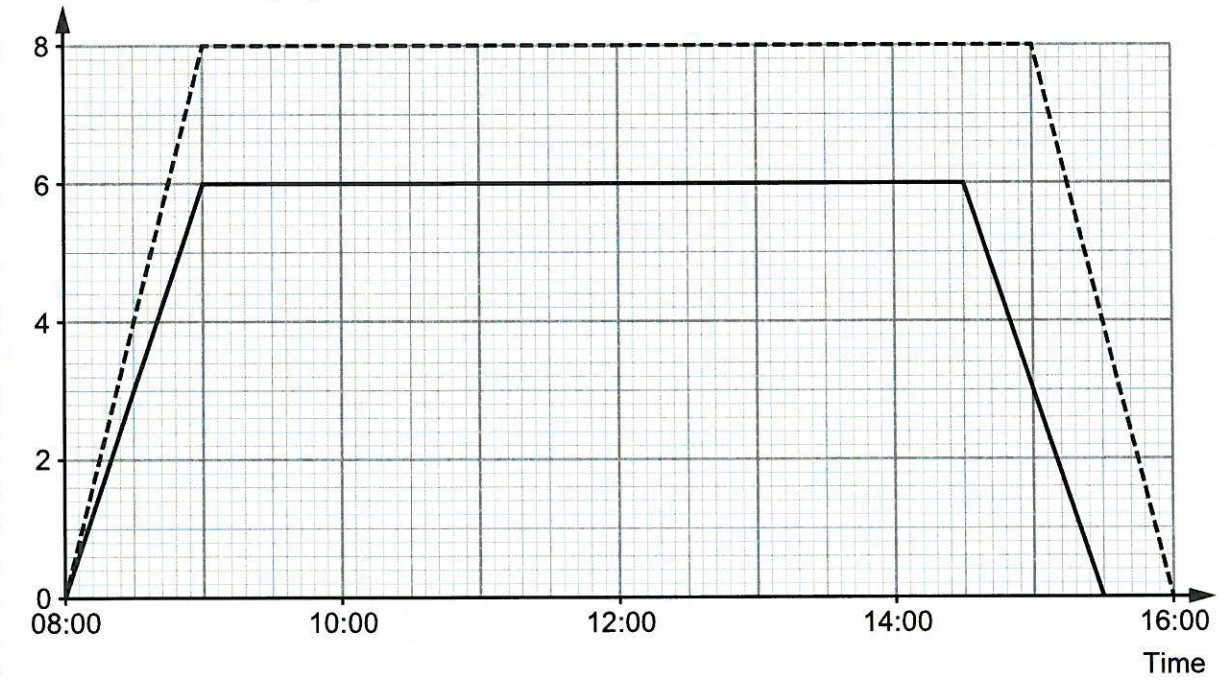
F+ I Maths Num U1 4 June 2017

Examiner only

2. 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

59 13

Examiner only

(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

(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]

3310U301
05

Examiner only

3. Rhys lives in St Asaph.
He wants to video call friends in Montreal, New Delhi and Sydney.

(a) The table below shows times around the world when it is 12:30 in St Asaph.

City	Time	Day
St Asaph	12:30	Saturday
Montreal	07:30	Saturday
New Delhi	17:00	Saturday
Sydney	21:30	Saturday

(i) When it is 23:30 on Saturday in St Asaph, what time and day is it in Montreal?
Circle your answer. [1]

04:30, Sunday 07:30, Saturday 18:30, Saturday

02:30, Saturday 12:30, Saturday

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(ii) When it is 01:00 on Sunday in Sydney, what time and day is it in St Asaph?
Circle your answer. [1]

16:00, Sunday 16:00, Saturday 10:00, Sunday

10:00, Saturday 06:00, Monday

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(b) 1 Australian dollar (AUD) is worth £0.61.

How much is £320 worth in Australian dollars?
Give your answer to the nearest Australian dollar. [2]

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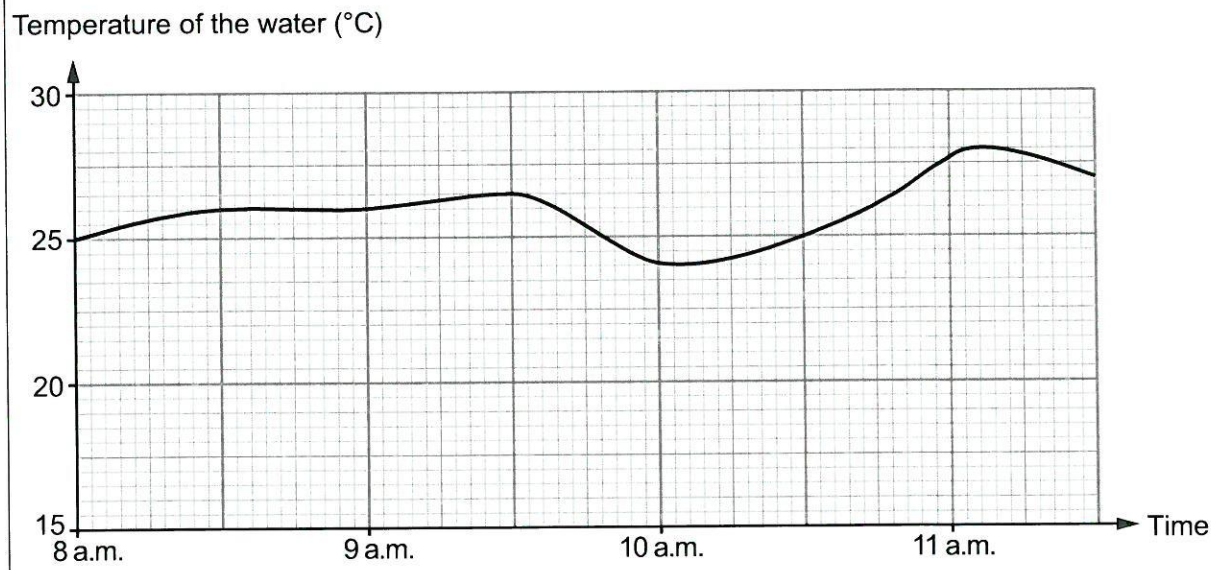
£320 = ... AUD

U2 I Num June 2019

Examiner only

(b) Jamil works at the *Hafan Parc* swimming pool.
He records the temperature of the water in the pool from 8 a.m. to 11:30 a.m.
Jamil draws the following graph.



Use the graph to answer the following questions about the temperature of the water between 8 a.m. and 11:30 a.m.

(i) What is the range of the temperature of the water? [1]

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(ii) For swimming, the most suitable temperature of the water in the pool is between 27°C and 28°C inclusive.
Find the length of time that the water in the pool was most suitable for swimming.
Give your answer in minutes. [1]

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The water was most suitable for ..... minutes

3310U401
11

16

Population Density

U1 I Num June 2019

Examiner only

11. The table below shows the approximate land area and population for 5 countries in 2014.

Country	Approximate land area, km^2	Approximate population
Argentina	2800000	40000000
Austria	84000	8400000
Canada	10000000	34000000
Pakistan	800000	170000000
United Kingdom	240000	62000000

(a) Which of the 5 countries had a population density of approximately 100 people per km^2? Circle your answer. [1]

Argentina Austria Canada Pakistan United Kingdom

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(b) Which of these countries had the greatest population density? Circle your answer. [1]

Argentina Austria Canada Pakistan United Kingdom

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(c) Which of these countries had a population density that is approximately 4 times the population density of Canada? You must show all your working. [2]

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END OF PAPER

17

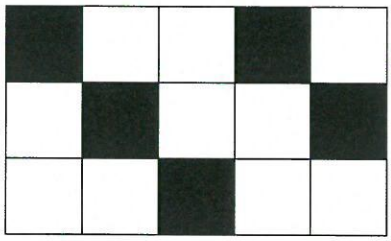
Fractions and Percentages

F Maths Nov 2017 U1

Examiner only

5. *(a)* What fraction of the following diagram is shaded?

Write your answer in its simplest form. [2]



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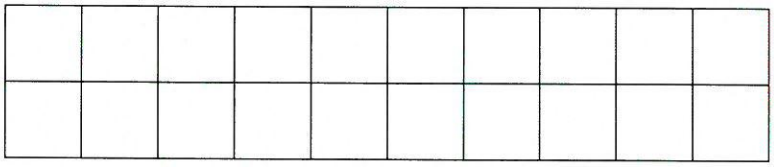
(b) Shade 40% of the following diagram. [1]



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~~137~~ 18

Examiner only

6. Suzanna and her 2 friends are studying at Aberystwyth University.
They rent a 3-bedroom house together.

The 3 friends share the cost of the rent equally between them.

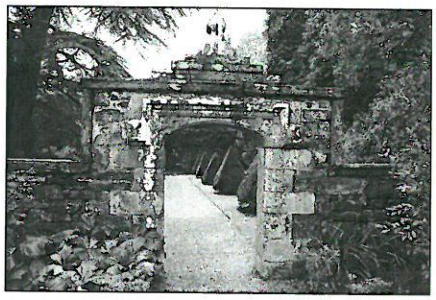
In April, the rent was £720 per month.
In October, the rent is to be increased by 15%.

How much rent will Suzanna pay in October? [4]

F+I Num June 2018 U1

Examiner only

2.



Mr and Mrs Blanc have 3 children, Valerie, Theo and Anton. The family is visiting Wales.
Valerie and Theo are 14-year-old twins.
Anton is 2 years old.

They visit Castell Gwynhir ruins and gardens.

A copy of the entrance board is shown below.

Castell Gwynhir ruins and gardens		
	Standard charge	Charge with 10% contribution towards improvements
Adult	£5.60	£6.40
Child – age 3 to 16	£2.30	£2.53
Child – under 3	Free	Free

(a) The family decides to pay the standard charges to visit Castell Gwynhir.
How much change will they get from £20?
You must show all your working. [3]

~~139~~ 20

F+I Num June 2018 U1

Examiner only

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

Theo looks at the charges with a 10% contribution towards improvements.

Theo says,
'The adult charge with an extra 10% is not right. It is too high!'

By how much is the adult charge too high?
You must show all your working. [3 + 2 OCW]

(c) The gardens at Castell Gwynhir cover an area of 714 000 m^2.

Water ponds cover $\frac{2}{7}$ of the area of the gardens.

Calculate the area covered by water ponds. [2]

Area covered by water ponds is ..... m^2

~~140~~ 21

F+I Num Nov 2017 8 42

Examiner only

5. A newspaper report claimed the following:

- 12% of the world population is left-handed.
- Twice as many men as women are left-handed.
- 30% of the world population is mixed-handed.
  Mixed-handed people prefer to use the left hand for some tasks and the right hand for others.
- It is very rare to be ambidextrous, that is being able to do all tasks equally well with either hand.

In 2011, Wales had a population of 3 063 000.
In 2014, Wales had a population of 3 092 000.

(a) Calculate the number of left-handed people living in Wales in 2011.
State what assumption you have made. [3]

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Assumption:

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(b) In 2011, Wales had a population of 3 063 000.
1 559 000 of these people were women.

In 2011, what **percentage** of the population of Wales were **men**?
Give your answer correct to 1 decimal place. [3]

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F+I Num Nov 2017 U2

Examiner only

(c) How many mixed-handed people do you think were living in Wales in 2014?
You must show your working.
Give your answer to the nearest 1000 people. [2]

(d) A country of 6 million people meets all the claims given in the newspaper report.
8% of the women in this country are left-handed.

There are 3 million men living in this country.
How many left-handed men would you expect there to be in this country? [4]

3310U401
09

~~F+2~~ 23

Turn over.

F+I Maths Num U2 Nov 2016

Examiner only

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

Railcard for 16 to 25 year olds

£30 for a year

Get $\frac{1}{3}$ **off** all your rail travel

Nerys and Eleri are sisters.
Nerys is 22 years old and Eleri is 27 years old.

The two sisters live in Holyhead.
Their aunt lives in Milford Haven.
They travel by train to visit their aunt 3 times a year.

Nerys buys a 16-25 Railcard to use for these journeys.
They buy single rail tickets for each journey.
The cost of a **single** rail ticket from Holyhead to Milford Haven is £84.50.
The journey home from Milford Haven also costs £84.50 per ticket.

In a year, how much less does Nerys pay than Eleri for the journeys to Milford Haven and back?
You must show all your working. [5 + 2 OCW]

~~143~~

24

F+I maths Num U2 Nov 2016

Examiner only

(b) Cristiano is 22 years old.
He sometimes travels from Rhyl to Llandudno Junction by train.
The cost of a single rail ticket from Rhyl to Llandudno Junction is £7.80.

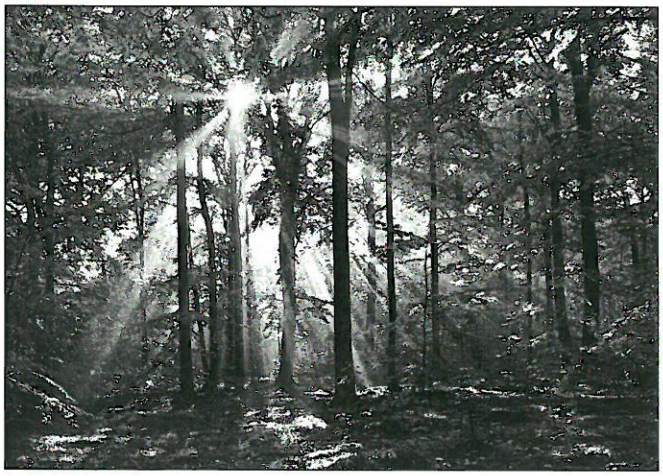
Nerys advises Cristiano to buy a Railcard.
Cristiano says,

> It is not worth paying £30 for the Railcard.

How many times in a year would Cristiano have to travel to make it cheaper for him if he buys a Railcard? [3]

Examiner only

6.



(a) The total area of all the woodlands in Wales is **303 000 hectares**.

Individual woodlands that have an area of 2000 hectares or more make up 76% of the total area of all the woodlands in Wales.

Complete the following statement.

'Woodlands with areas of **less than** 2000 hectares in Wales cover a total area of

..... hectares.' [3]

I+H Maths Num U2 Nov 2016

Examiner only

(b) The price of softwood changes each year.
The price has increased by 6% every year for each of the last **5 years**.
Before this, the price had decreased by 2% every year.
Seven years ago the price of softwood was £34 per m^3.

Calculate the current price of softwood. [3]

Current price of softwood is £ ..... per m^3

~~146~~ 27

I+H Num Nov 2017 42

Examiner only

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

Handmade socks, knitted using pure cashmere wool, are very expensive to buy.

Rowena buys cashmere wool in 20 g balls.
Each ball of cashmere wool costs her £1.42.
She pays her sister £8 to knit each pair of socks.
135 g of cashmere wool is used to knit each pair of socks.

Rowena sells 40 pairs of cashmere socks for £18.95 per pair.
What is her percentage profit?
Give your answer correct to 2 significant figures.
You must show all your working.

[7 + 2 OCW]

Rowena's percentage profit when selling all 40 pairs of socks is ..... %,
correct to 2 significant figures.

3310U601
09

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28

Examiner only

2. Luigi lives in south Wales.
Rosina lives in west Wales.
For each of the first 65 days of 2017, they recorded whether or not it rained.

Luigi recorded that it rained on 28 of these days.
Rosina recorded that it rained on 40% of these 65 days.

Luigi says,

> 'For the first 65 days of 2017, there were more days with rain where I live than where Rosina lives.'

Is Luigi correct?
You must show all your working. [3]

~~U2~~ 29

Examiner only

5.

(a) Jasmine entered herself, Sophie and Bryn as a group in a talent contest.
Bryn only had a minor part.

Bryn, Sophie and Jasmine won the contest.
They shared the prize money in the ratio 2 : 6 : 7, with Bryn getting the smallest share.
Jasmine won £560, the largest share.

(i) How much money did Bryn and Sophie each win? [4]

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Bryn receives £ .....

Sophie receives £ .....

(ii) Jasmine gave 15% of her winnings to charity.
How much did Jasmine have left? [2]

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~~11~~ 9

30

Examiner only

(b) The talent contest is held once a year.
Every year, the cost of putting on the talent contest increases by 10% of the previous year's cost.
In summer 2014 the cost was £6600.

Calculate the cost of putting on the summer 2017 talent contest.
You must show all your working. [3]

~~50~~ 31

Turn over.

Examiner only

9. *(a)*

Lotty and Rafael decide to enter a prize draw.
They agree to share any money they win in the ratio 2 : 3 respectively.
After winning a total of £2000, they think again and decide that Lotty's share should be increased by 30%.

(i) Rafael thinks that his share will be reduced by 30%.
Without any calculation, explain why Rafael's thinking is incorrect. [1]

(ii) Calculate the amount of money Lotty wins after the decision is made to increase her share. [4]

Examiner only

(iii) Find the ratio that is now used to share the money between Lotty and Rafael. Express your answer in its simplest form. [3]

Lotty's winnings : Rafael's winnings = ... : .....

(b) In another prize draw, it was planned to give £5000 as the first prize. To make it more popular, the organisers decide to increase this first prize by 26%.

The most efficient method of calculating the amount of the increased first prize is

$$1{\cdot}26 \times 5000.$$

The second prize was planned to be £3000, but it is now decided to decrease this prize by 6%.

Write down the most efficient method of calculating the amount of the decreased second prize.
You do not have to work out the answer. [1]

I and H Num June 2018 4H

Examiner only

9.

Olga took out a high-interest loan for £400.
She paid back £49 per month for 20 months to clear the loan.
Calculate the total interest that Olga paid as a percentage of the original loan. [4]

~~153~~ 34

Examiner only

9. Gwenda enjoys road running.

(a) She keeps a record of her run each day this week.

Day	Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Distance	4·6 km	5·4 km	2·2 km	6·2 km	7·2 km	2·2 km	3·4 km
Time	26 mins	31 mins	12 mins	35 mins	40 mins	14 mins	22 mins

Last week, her average speed for the week was 9·6 kilometres per hour.
Calculate Gwenda's percentage improvement in her average speed from last week to this week.
You must show all your working. [6]

Percentage improvement is ..... %

~~154~~ 35

I+H Num June 2018 U1

Examiner only

11. *(a)* Kingsley invests £3000 in an account that pays 2% compound interest per annum. He does not make any further payments into his account. He does not withdraw any money from his account.

How much will Kingsley have in his account after **two years**? [3]

Amount in Kingsley's account after two years is £ .....

155

36

I and H Num June 2018 U1

Examiner only

(b) Kingsley buys a portable *Bluetooth* speaker.
The speaker has been reduced by 20% in a sale.
He pays £72 for the speaker in the sale.
What was the original price of the speaker? [2]

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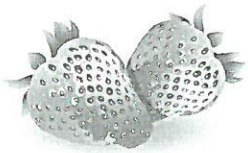
Original price of the speaker is £ .....

~~156~~ 37

Examiner only

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

Sioned works in a grocery shop.
She has made a poster for the window of the shop.



Strawberries
£8.60 per kg

Raspberries
Today's special offer

..... per kg

Sioned has forgotten to write the price of raspberries on the poster.

Mr Thomas buys $\frac{1}{4}$ kg of strawberries and $1\frac{1}{2}$ kg of raspberries.

He pays with a £20 note.
He gets £2.55 change.

Calculate the price of 1 kg of raspberries.
You must show all your working. [6 + 2 OCW]

38

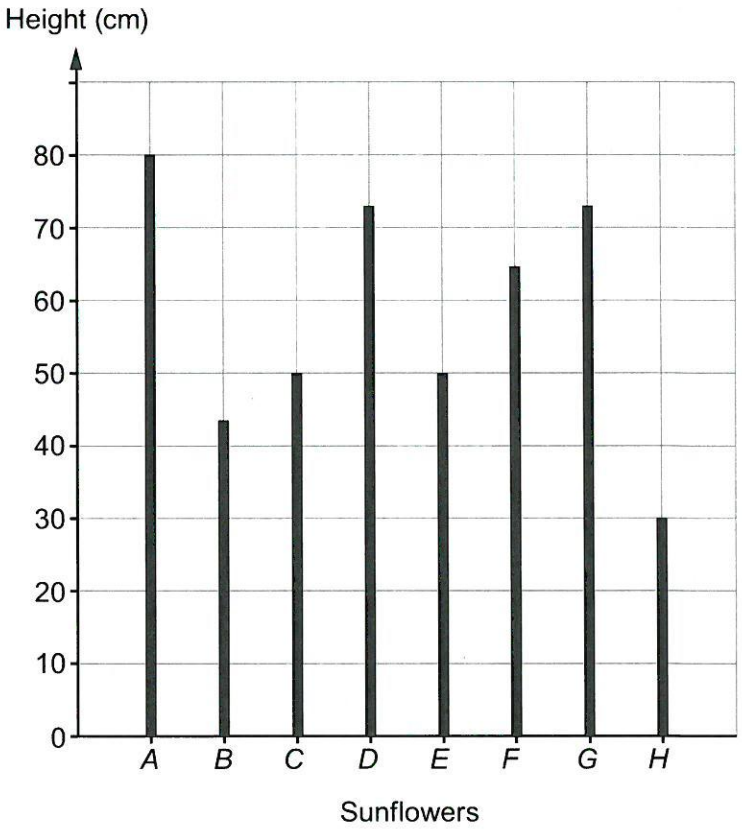
2. Sunflower seeds come in a packet.

> Sunflower seeds
>
> Plant in May
>
> Grow to heights of up to 90 cm (36 inches)

Dieter planted 8 sunflower seeds in May.
He labelled the sunflowers *A*, *B*, *C*, *D*, *E*, *F*, *G* and *H*.

On 21st August, he measured the heights of all the sunflower plants in cm.

Dieter then drew a graph, as shown below.



39

Examiner only

(a) Use the graph to answer each of the following questions.

(i) What fraction of the height of the tallest sunflower is the height of the shortest sunflower?
Circle your answer. [1]

$\frac{3}{10}$ $\frac{3}{7}$ $\frac{3}{5}$ $\frac{3}{8}$ $\frac{3}{80}$

.....

.....

(ii) What is the ratio of the number of sunflowers with heights less than 55 cm to the number of sunflowers with heights greater than 55 cm?
Circle your answer. [1]

5 : 3 3 : 5 1 : 3 3 : 1 1 : 1

.....

.....

(b) Dieter's friend, Glyn, also planted sunflower seeds.
Glyn's tallest sunflower grew to a height of 24 inches.
Is this taller or shorter than Dieter's tallest sunflower?
You must show all your working to support your answer. [2]

Taller than Dieter's tallest sunflower ☐

Shorter than Dieter's tallest sunflower ☐

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3310U301
05

40

Turn over.

Examiner only

3. Aled and Gareth went on holiday to France.

(a) The total cost of the holiday was £660.

- Aled's mother paid $\frac{1}{3}$ of the total cost.
- Aled and Gareth shared the remaining cost in the ratio 1 : 9.

(i) Calculate how much each person paid towards the cost of the holiday. [4]

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Aled's mother paid £ .....

Aled paid £ .....

Gareth paid £ .....

(ii) Explain how you could use your answers to check that they are correct. [1]

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Y1 I Num June 2019

Examiner only

(b) Gareth's luggage weighed 21·13 kg.
This was over the maximum of 20 kg allowed.

Gareth removed items from his luggage so that its mass was:

- as close to 20 kg as possible,
- **not greater** than 20 kg.

From the following list of items, which **two** items did Gareth remove?
You must show all your working. [3]

Coat	Headphones	Jumper	Book	Hat
820 g	300 g	320 g	340 g	200 g

3310U301
07

42

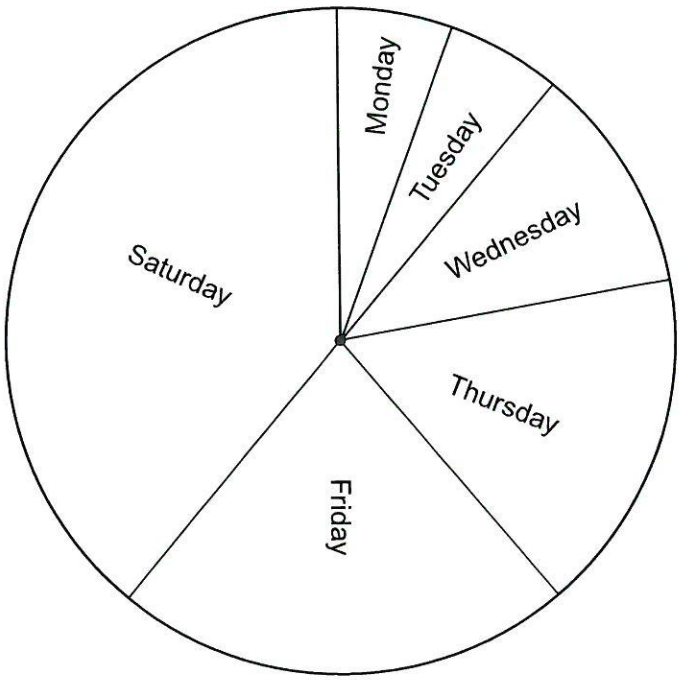
Turn over.

Examiner only

1. Ian owns two shops. One is in Ffordd Owain and the other is in Arthur Avenue. For each shop, Ian has been presented with the sunglasses sales for last week.

Ffordd Owain daily sunglasses sales for last week

In total, 90 pairs of sunglasses were sold.



Arthur Avenue daily sunglasses sales for last week

Key:  represents 4 pairs of sunglasses

43

U2 I Num June 2019

Examiner only

(a) For each shop, what fraction of the sunglasses sold last week was sold on Friday? Express your answers as fractions in their simplest terms.

(i) Ffordd Owain: [2]

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.....

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Fraction, in its simplest terms .....

(ii) Arthur Avenue: [2]

.....

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.....

Fraction, in its simplest terms .....

(b) At the Arthur Avenue shop, what percentage of the sunglasses sold last week was sold on Tuesday? [2]

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(c) On Saturday, how many more sunglasses were sold in the Ffordd Owain shop than in the Arthur Avenue shop? [5]

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3310U401 05

44

U2 F Num June 2019

Examiner only

(b) Delyth invested £500 in a saver bank account 20 years ago.
She did not withdraw money or make any other payments into this account.
The bank paid 2·2% compound interest per annum during the first 5 years.
Compound interest at 1·6% per annum was paid for the remaining 15 years.

Delyth closes the account after 20 years.
How much money should she receive? [4]

45

Standard form

I+H Maths Num U1 June 2017

Examiner only

12. *(a)* A standard piece of A4 paper is usually 0·08 mm thick.
What is 0·08 mm written in **metres** in standard form?
Circle your answer. [1]

8×10^4 8×10^{-4} 8×10^{-3} 8×10^3 8×10^{-5}

(b) A piece of card is 1 mm thick.
A stack of these pieces of card is 3×10^{-2} metres high.

(i) Calculate how many pieces of card there are in the stack. [2]

(ii) What assumption have you made in answering *(b)*(i)? [1]

~~48~~ 46

Examiner only

(c) In 2012 it was recorded that

- the total mass of the paper used for printing newspapers, in the world, was $2{\cdot}88 \times 10^7$ **tonnes**,
- the world population was approximately $7{\cdot}2 \times 10^9$ people.

Use this information to calculate the mass of paper per person used to print newspapers in 2012.
Give your answer in **kg per person**. [4]

Mass of paper: ..... kg per person

END OF PAPER

Sequences

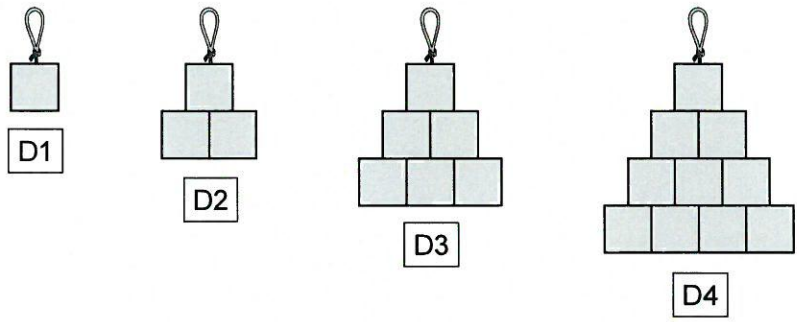
F+I Maths Num 4 June 2017

Examiner only

9. Ollie and Josef both have jobs in a workshop that makes decorations.

They make decorations using small squares of stained glass.

(a) 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.

(i) 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]

.....

.....

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.....

(ii) 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]

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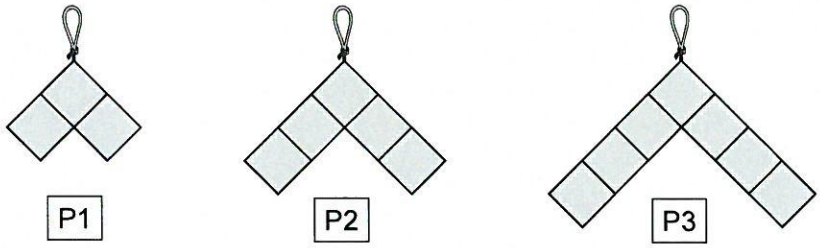
48

Examiner only

(b) Josef has made the following three decorations using small squares of stained glass.



Josef labels these patterns P1, P2 and P3 in order.

Josef continues to make decorations following the pattern he has started.

(i) How many **more** squares would he need to make pattern P22 than to make pattern P18? [1]

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.....

.....

(ii) Josef has 22 squares.

Josef states,

'I think I can make one complete decoration using **all** 22 squares, with none left over.'

Is Josef correct?

Yes ☐ No ☐

Give a reason for your answer. [1]

.....

.....

(iii) Each small square of stained glass measures 0·5 cm by 0·5 cm.
The perimeter of one of Josef's decorations is 10 cm.
Complete the label that Josef would use for this decoration. [2]

P .....

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F Num June 2018 41

Examiner only

4. A lighting company sells sets of lights in different sizes.
Some of the sets are shown below.

Set 1 3 light bulbs	
Set 2 5 light bulbs	
Set 3 7 light bulbs	

The pattern can be continued to make larger sets of lights.

(a) How many light bulbs are needed to make **Set 5**?
Circle your answer. [1]

9 10 11 12 13

.....

.....

(b) Which **set** has 27 light bulbs? [2]

.....

.....

Set .....

(c) A customer thinks that to find the number of bulbs that are in a set, you multiply the set number by 3.
Is the customer correct?

Yes ☐ No ☐

Give a reason for your answer. [1]

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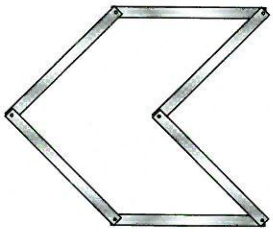
3310U101
09

50

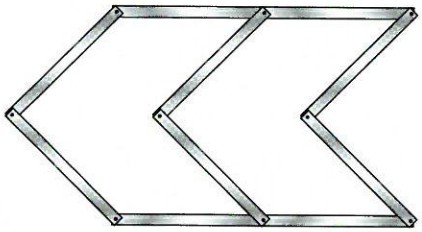
Turn over.

Examiner only

4. Sophia designs jewellery.
She is working on the design of a bracelet.
Each link of the bracelet uses lengths of silver, ▭ .



1 link
6 lengths of silver



2 links
10 lengths of silver

(a) How many lengths of silver are needed for 3 links of the bracelet?
Circle your answer. [1]

14 16 12 18 10

(b) Sophia thinks that she needs 6 lengths of silver for each extra link.
Explain why Sophia is not correct. [1]

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(c) Sophia uses 50 lengths of silver to make a bracelet.
How many links are there in this bracelet? [2]

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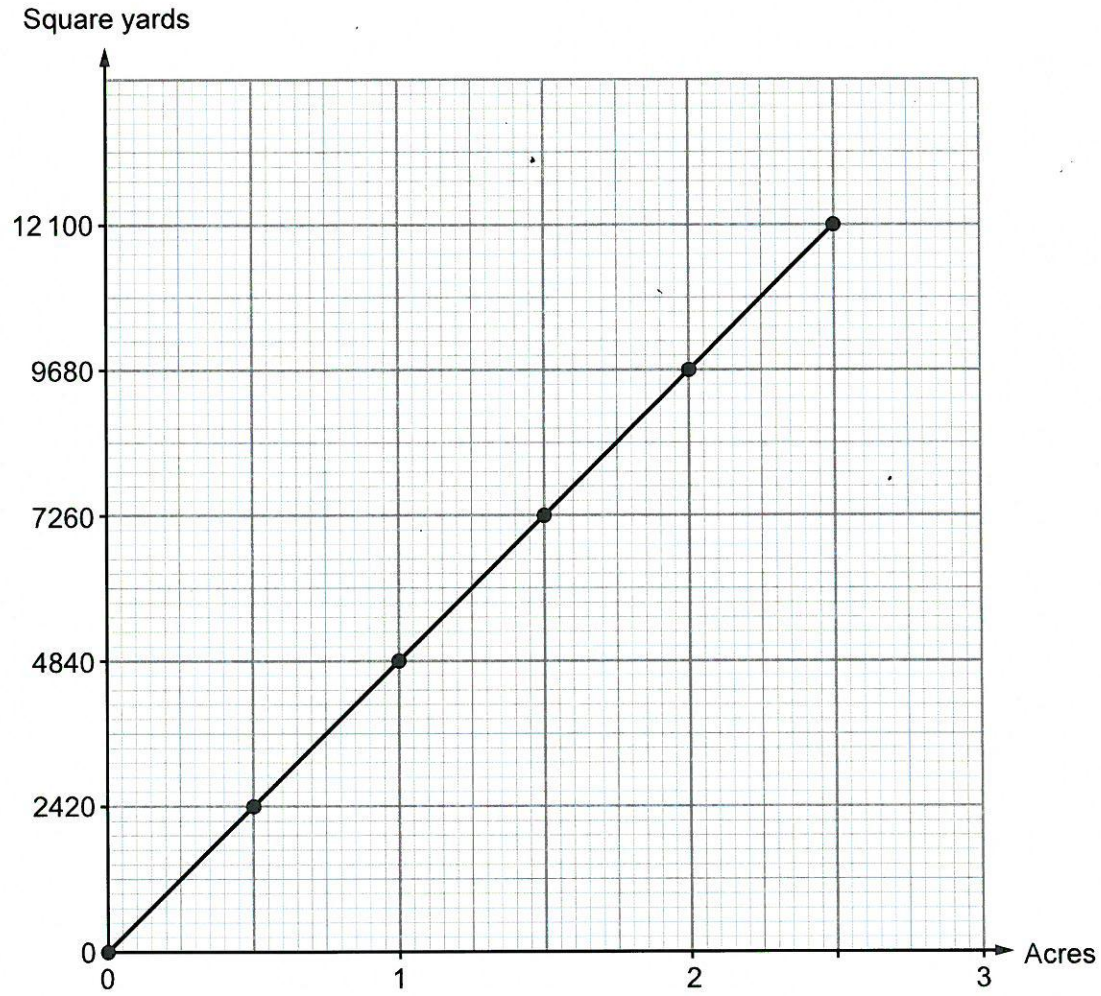
3310U101
11

Conversion Graphs

F+I Maths Num U1 Nov 2016

Examiner only

1. Marcus is a farmer.
He has his own conversion graph to change between acres and square yards.



Complete each of the following statements.

(a) 3 acres is equal to ..... square yards. [1]

.....

.....

.....

(b) 5·5 acres is equal to ..... square yards. [2]

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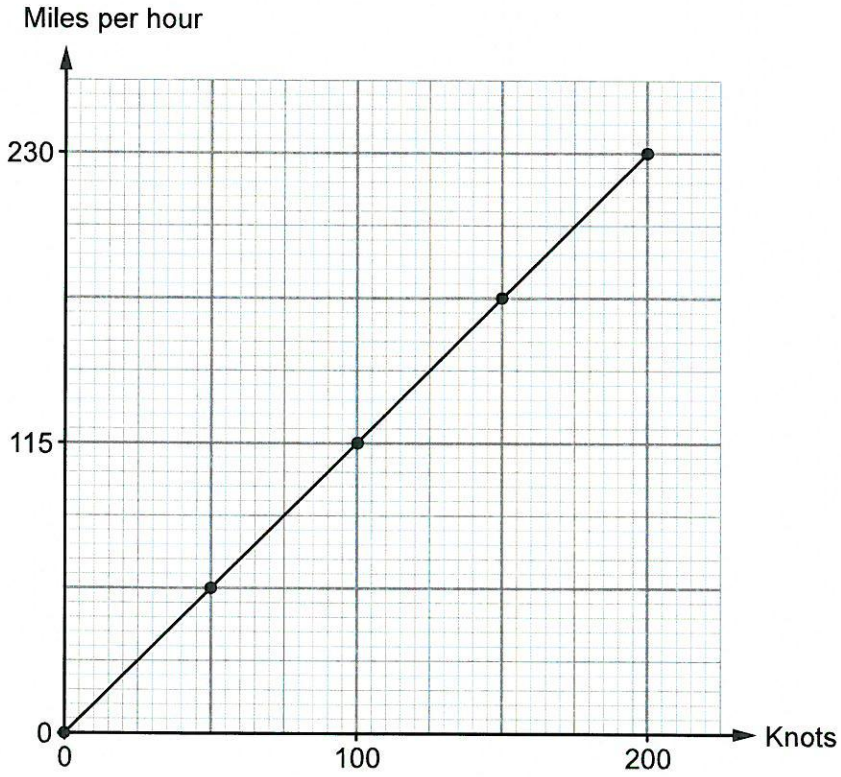
66 52

3310U301
03

Examiner only

7. Alun has made his own conversion graph to change knots to miles per hour.



(a) Use Alun's conversion graph to write 150 knots in miles per hour. [1]

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Examiner only

(b) Nikita thinks Alun's conversion graph may be inaccurate.

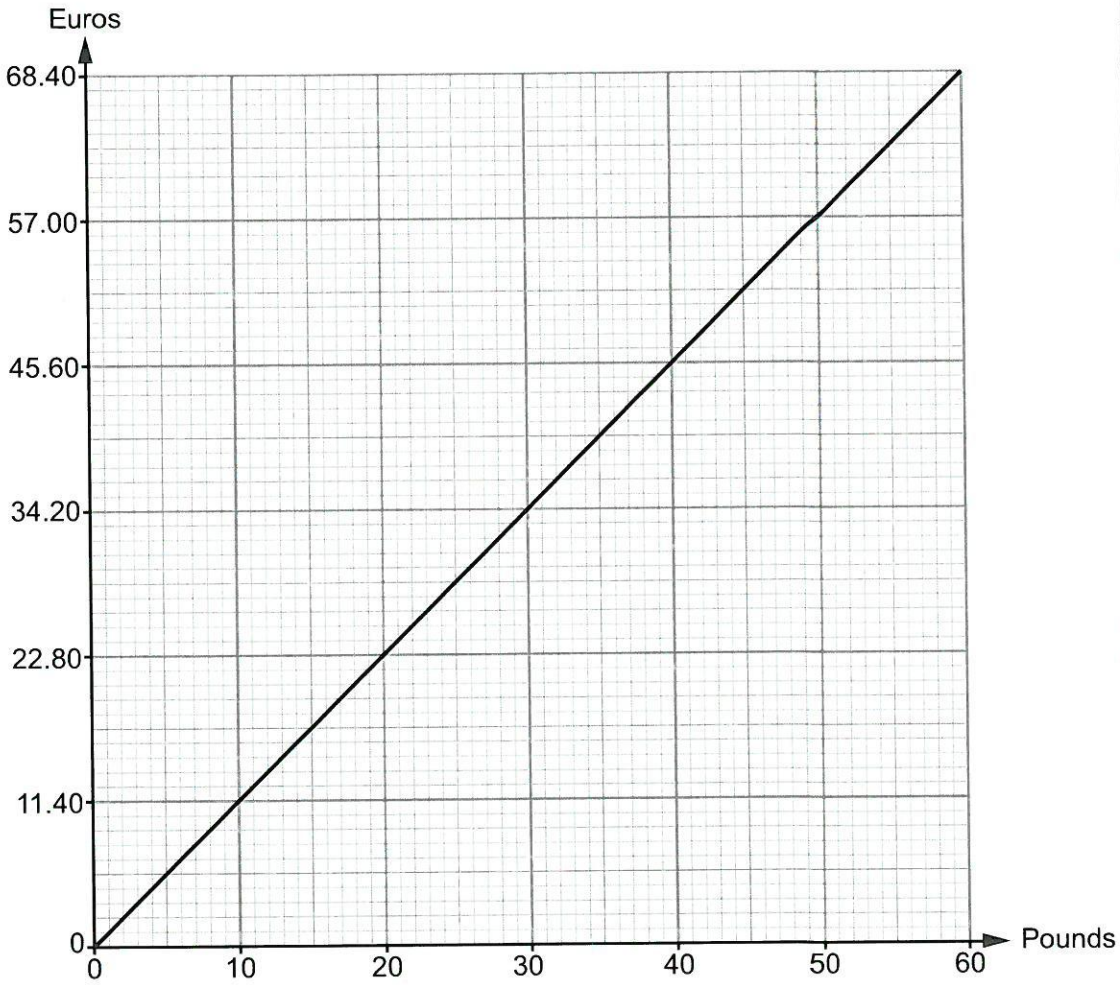
Nikita knows that 1000 knots is 1150.779 miles per hour, correct to 3 decimal places.

Convert 20 knots to miles per hour
- using Alun's conversion graph, and then
- using Nikita's values.

Calculate the difference, in miles per hour, between your answers.
Give your answer correct to 2 decimal places.
You must show all your working. [4]

Examiner only

(c) Before going on holiday, Aled made a conversion graph to help him understand prices in euros.



Use Aled's conversion graph to answer the following questions.

(i) A camera costs £90.
How much is this in euros? [2]

.....

.....

Camera costs ..... euros

(ii) A meal costs £25.
How much is this in euros? [2]

.....

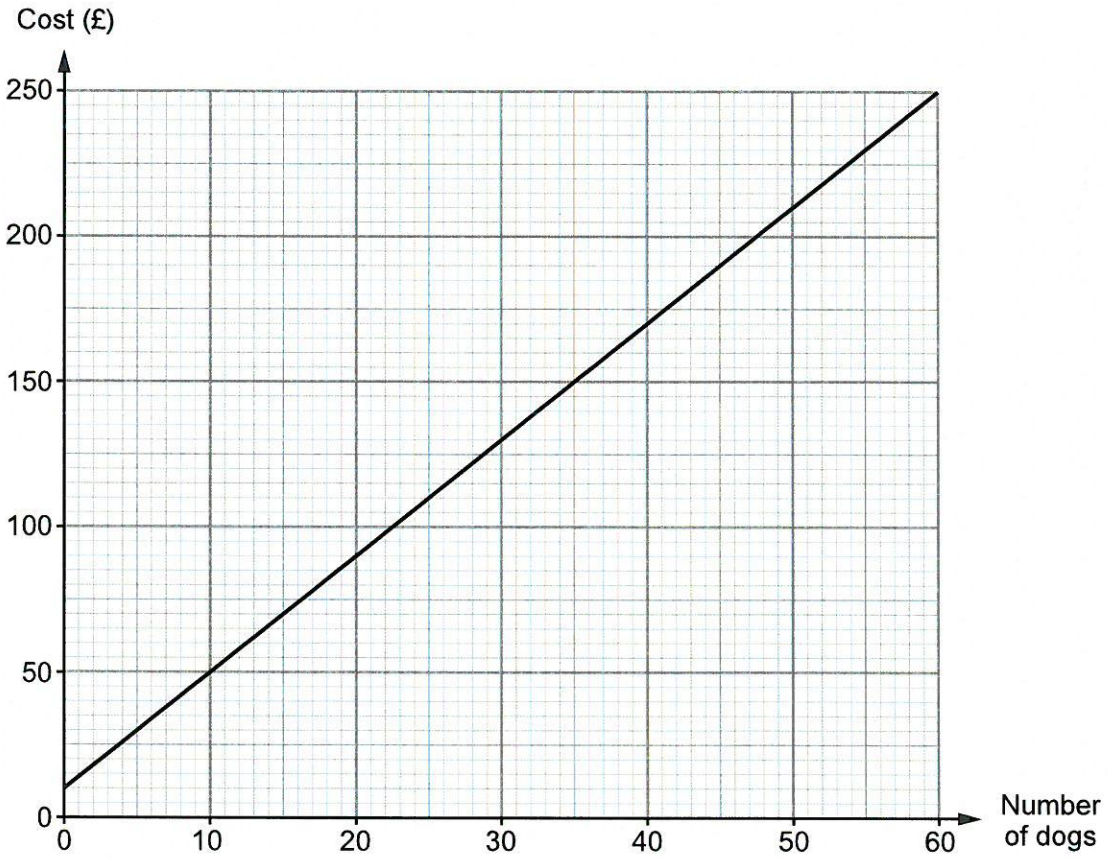
.....

Meal costs ..... euros

55

Examiner only

2. William owns and runs dog kennels.
His costs depend on the number of dogs in the kennels.
The running costs for one day are shown on the graph below.



(a) Why does the graph not pass through (0, 0)? [1]

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~~69~~ 56

I+H Num Nov 2017 U1

Examiner only

(b) What is the increase in the daily running costs for each additional dog that is kept in the kennels? [2]

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.....

(c) (i) Freda also runs a dog kennels.
The cost of keeping 20 dogs in her kennels for one day is £130.
She knows that as the number of dogs increases, the overall cost increases at the same rate as in William's kennels.

Display this information on the graph paper opposite. [2]

.....

.....

.....

.....

(ii) Find the cost of keeping 30 dogs for one day in Freda's kennels. [1]

£ .....

3310U501
07

70 57

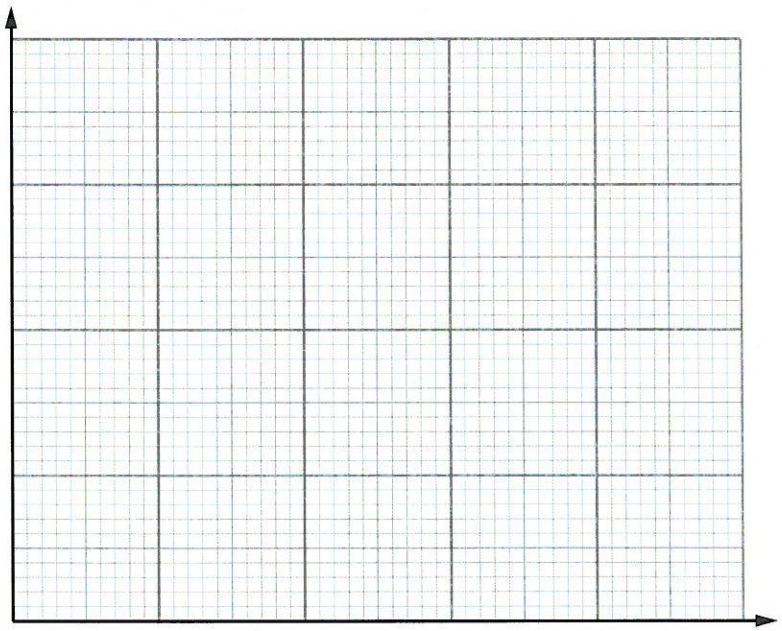
Examiner only

12. Petra is organising a prom for her year group.
The number of people attending the prom is likely to be between 20 and 80.

The cost of holding the prom at *Hotel Afonwen* would be as follows.

- Hire of the room: £100
- Food: £15 per person
- Welcome drink on arrival: £3 per person
- Decorations: £2 per person

(a) Draw a graph to illustrate the total cost of holding the prom for between 20 and 80 people.
Use the graph paper below. [4]



Examiner only

(b) Petra decides to share all the costs equally between the people attending.

- Let £P be the price paid per person.
- Let N be the number of people attending the prom.

Write a formula for P, in terms of N. [3]

(c) Hiring a larger room at *Hotel Afonwen* costs £200.
The cost per person for food, welcome drinks and decorations remains the same.
If the total cost is £2240, how many people attend? [2]

Loci

I+H Maths Num u1 Nov 2012

Examiner only

8. The scale diagram opposite shows an Eisteddfod camping field.

The camping field is 100 metres long and 80 metres wide.

A river runs along the side *AB*.
There is a hedge along *AD*.
There is a fence along *BC*.
DC is an opening with access to the Eisteddfod camping field.

The scale used is **1 cm represents 10 metres**.

A barbecue area is to be built on the camping field.

The barbecue area must be

- nearer to the river than to the opening to the Eisteddfod camping field,
- nearer to the river than to the hedge,
- more than 30 metres from the corner of the field where the hedge meets the river.

Draw suitable lines on the diagram. Shade the region where the barbecue area could be built. [5]

157

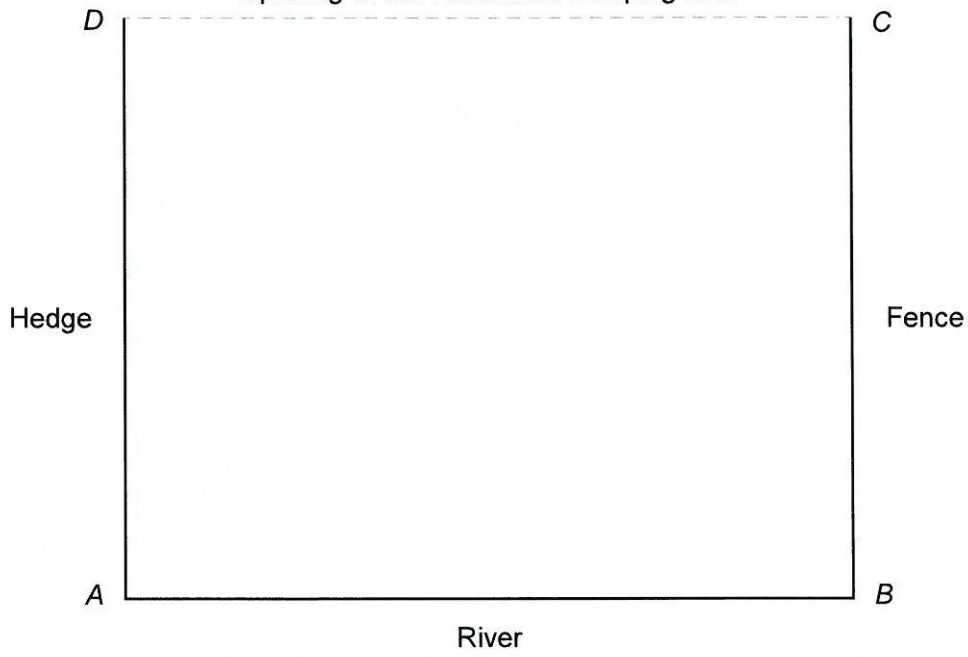
60

I+H Maths Num 41 Nov 2016

Examiner only

1 cm represents 10 metres

Opening to the Eisteddfod camping field



3310U301
13

156

61

Turn over.

Examiner only

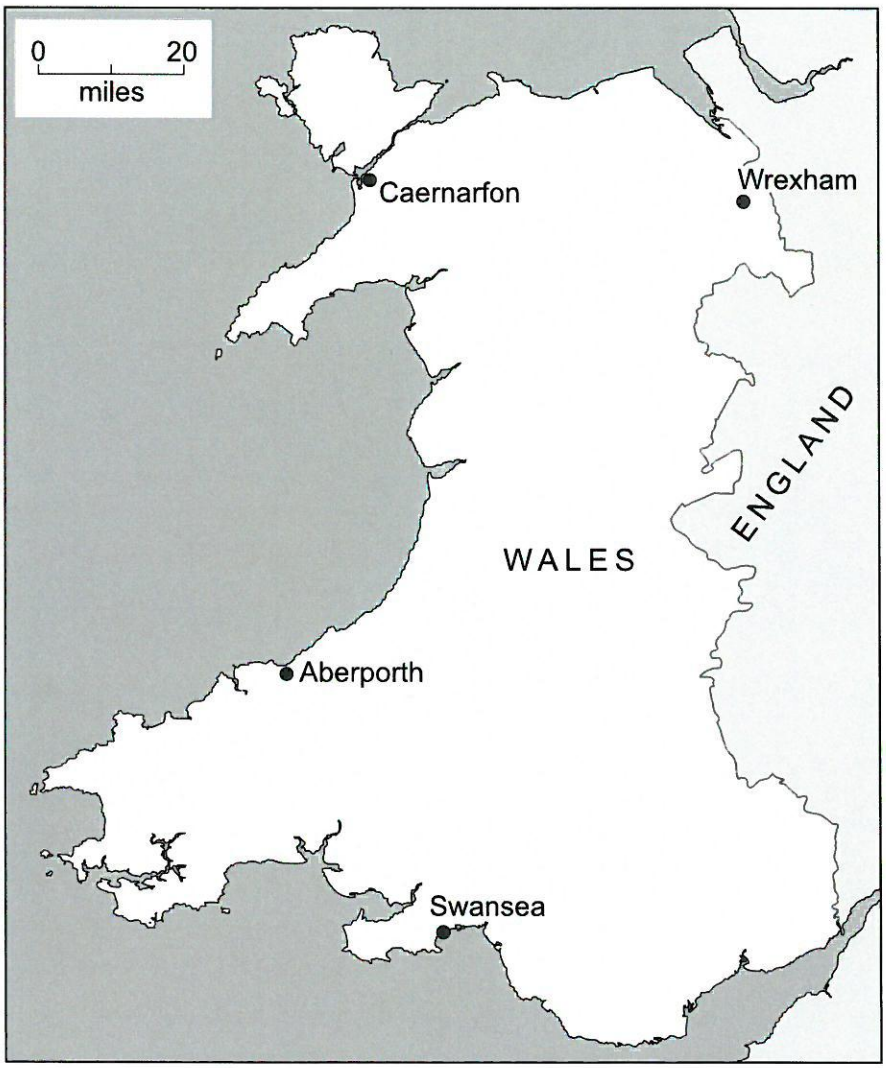
9. *(a)* *Organics4U* is planning to have its headquarters in Wales.
The manager has instructed Ffion to look for a site for the headquarters.

Here are the instructions that Ffion has been given by her manager.

'Find the point that is
- an equal distance between Wrexham and Aberporth, and
- an equal distance between Caernarfon and Swansea.

The new headquarters needs to be within 20 miles of this point.'

On the map below, shade the region, **in Wales**, that Ffion should identify for her manager. [4]



Examiner only

10. Mali's scooter depreciated (decreased) in value by 24% in the **first** year.
In all further years, her scooter depreciated by 13% of its previous year's value.
She originally paid £850 for her scooter.
Calculate the value of Mali's scooter after 7 years. [3]

After 7 years, the value of Mali's scooter was £ .....

11. Sanjay stacks three boxes in a pile.
The heights of the boxes are 25 cm, 36 cm and 47 cm.
They are all measured correct to the nearest centimetre.
What is the greatest possible height of the stack of the three boxes? [2]

Greatest possible height of the stack of three boxes is ..... cm

~~160~~ 63

Examiner only

2. *(a)* Bronwen and Alvaro decide to keep some alpacas on their farm in Patagonia.

Alvaro knows it is possible to keep between 4 and 6 alpacas on each acre of suitable farmland.
They have 13 hectares of farmland that they want to use to keep the alpacas.
Bronwen knows that 1 acre is 4046·86 m^2 and that 10 000 m^2 = 1 hectare.

Use this information to advise Bronwen and Alvaro on the number of alpacas they could keep on their farmland.
State any assumption that you make.
You must show all your working. [6]

Assumption:

(b) Bronwen decides to place a cylindrical water container in the small paddock on the farm.

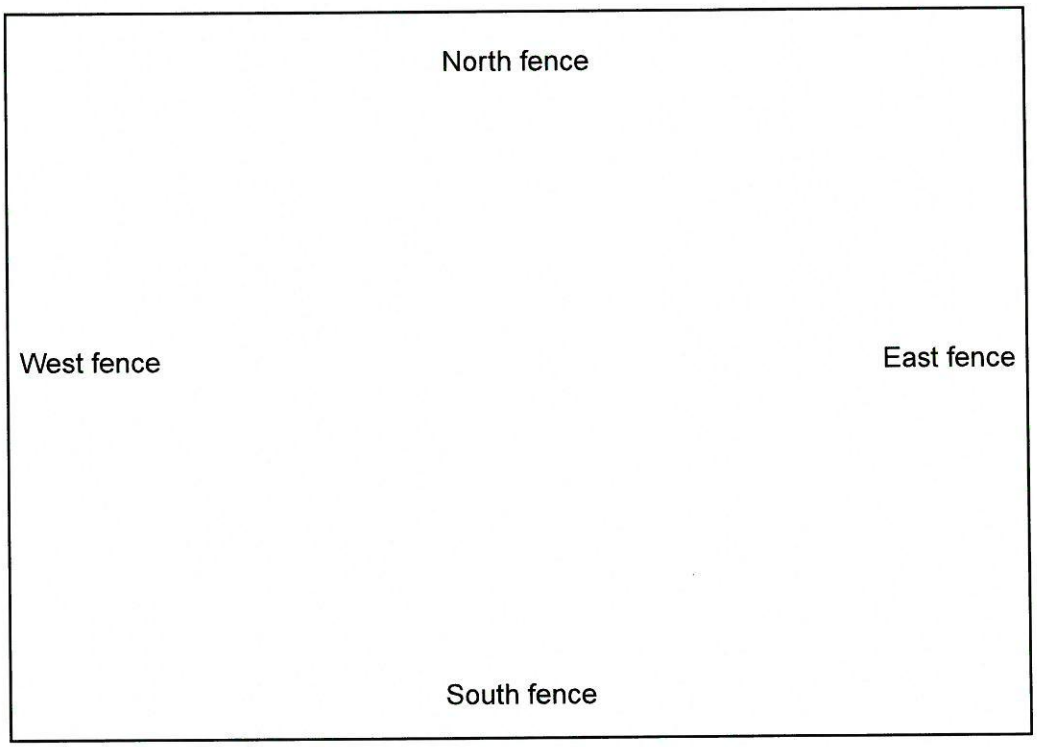
The water container has a diameter of 1·4 metres.

(i) The scale diagram opposite shows the small paddock on the farm.
The small paddock is rectangular, measuring 7 metres by 5 metres.

I+H Num Nov 2017 U2

Examiner only

Scale 2 cm represents 1 m



Bronwen decides to place the centre of the water container so that it is:

- equidistant from the south fence and the east fence,
- 3 metres from the south fence.

Show the placement of the water container on the scale diagram of the small paddock above.
Your diagram should include an **accurate plan view** of the **water container**. [4]

(ii) The water container holds 900 litres of water when full.
Calculate the height of the water container in centimetres. [4]

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.....

The height of the water container is ..... cm

~~162~~ 65

Examiner only

7. The diagram below shows a sketch of the existing gas pipes that run to and from Tŷ Gwyn. It also shows a proposed 180 m gas pipe which is to be laid to provide gas to Cae Nia. The proposed pipe bisects the angle formed by the existing pipes at Tŷ Gwyn.

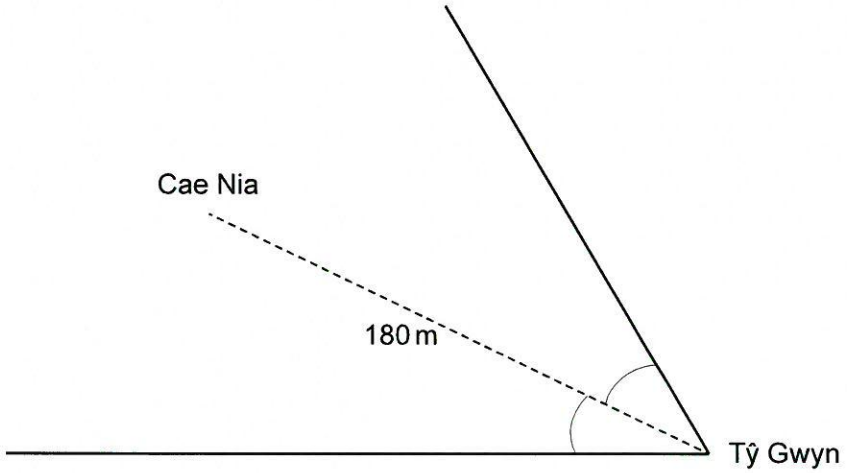

Diagram not drawn to scale

Complete the scale drawing below to show the proposed pipe.

- You must use a pair of compasses to construct the angle bisector.
- Use a scale of 1 cm to represent 20 metres. [3]

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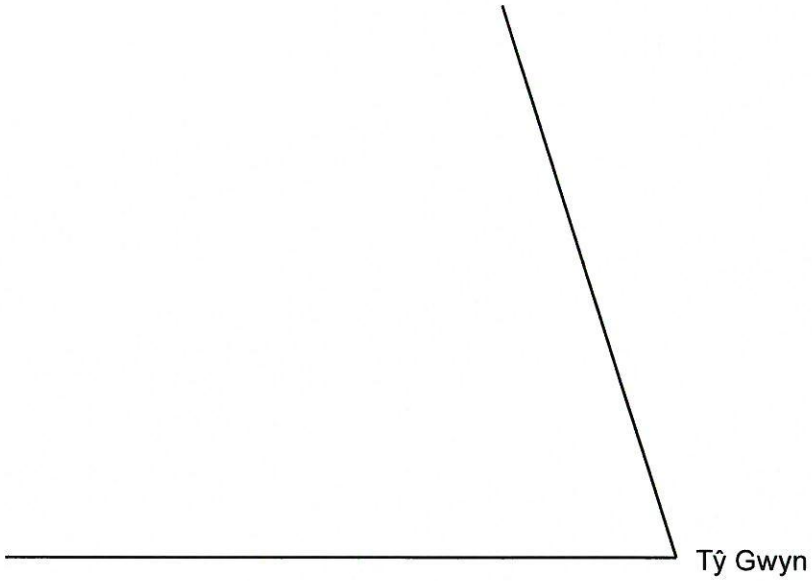
.....



3310U301
13

Electricity Bill

U2 I Num June 2019

Examiner only

8. *(a)* On 1st June, Delyth budgets for her next electricity bill.
This bill will be for the months of June, July and August.
Her bill will have to be paid at the beginning of September.

She knows:

- the standing charge is £8 **per month**,
- her meter reading on 1st June is 20 150 kWh,
- her estimate for her meter reading on 31st August is 20 950 kWh,
- her agreement states that electricity costs 23p per kWh,
- VAT at 5% is payable on the total of the standing charge and the cost of the electricity used.

Calculate how much she should budget each month so that she is able to pay her next electricity bill. [7]

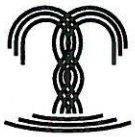
67

Coordinates

F Maths Num 4 Nov 2016

Examiner only

1. A gardener is designing a new garden.
He uses a coordinate grid to show the position of plants and trees.
He has started to create a plan for one of his customers.
The table below shows some of the items that are to be put into the garden.

 Wooden table & chairs	 Fountain	 Flowering shrub
 Large tree	 Winter tree	 Flowering tree

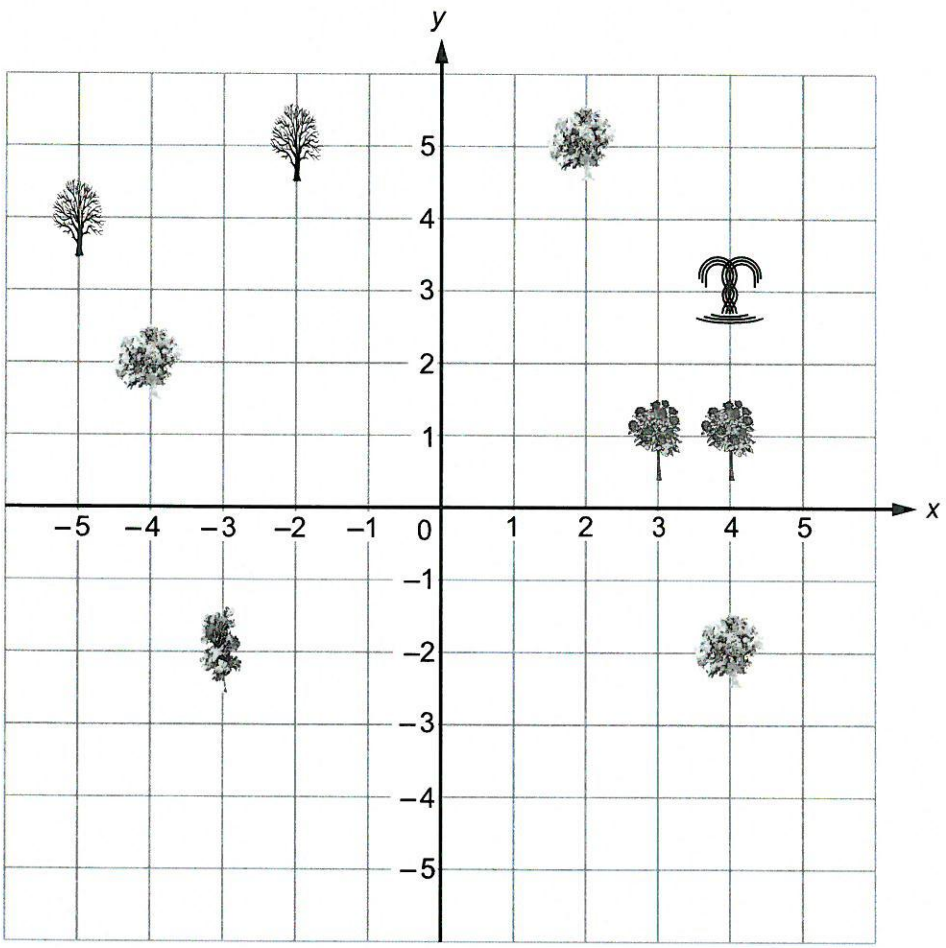
~~110~~ 68

F Maths Num 1 Nov 2016

Examiner only

(a) What are the coordinates of the fountain?
Circle your answer. [1]

(4, 3) (3, 3) (3, –3) (3, 4) (4, –3)



(b) The gardener is going to place
- the wooden table and chairs at A (–1, 2)
- a flowering shrub at B (1, 0).

Plot the **positions** of points A and B on the grid above. [2]

(c) The lawn in the garden is rectangular.
It has length 4·5 metres and width 3 metres.

(i) What units should be used for the area of the lawn?
Circle your answer. [1]

m cm m^2 m^3 yards

(ii) What is the area of the lawn? [2]

.....

.....

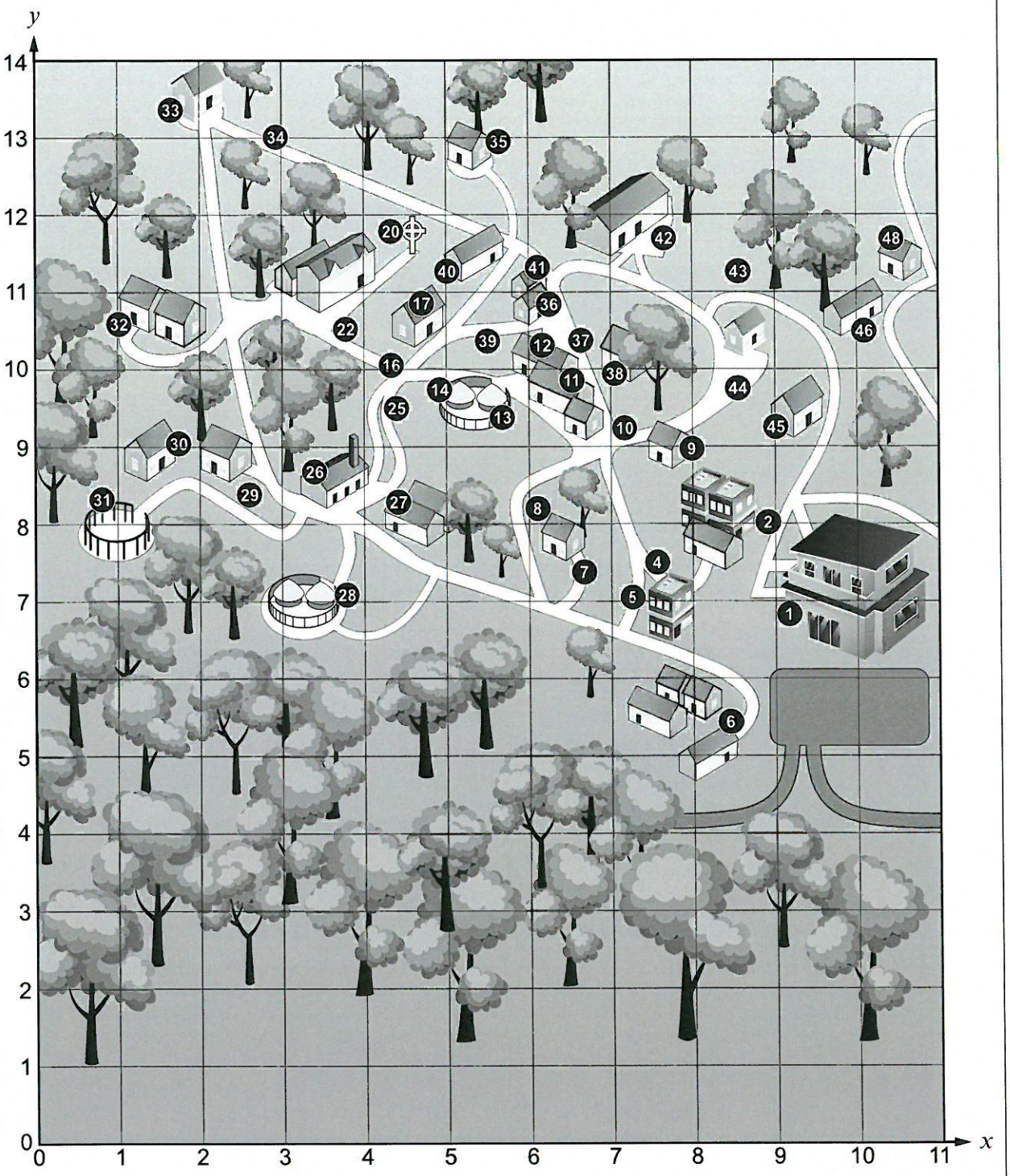
3310U101
05

69

Turn over.

Examiner only

1. Look at the coordinate grid below. It is a map of St Fagans National Museum of History. Mr Jones visited St Fagans. He used the grid to find the places that he wanted to see.



12 70

Examiner only

(a) What are the coordinates of the Timber Circle? This is shown as number 31 on the grid. [1]

.....

(b) Mr Jones stopped at (6, 7) during his visit. Mark this position on the grid with a **cross** (×). [1]

.....

(c) Mr Jones and Bethan were standing outside the Sawmill (number 26).
They were both facing the Tannery (number 27).
Bethan asked Mr Jones for the directions to the Newbridge War Memorial (number 20).
Complete the set of directions for the shortest route that Mr Jones could have given Bethan. [2]

Turn left from the Saw Mill.

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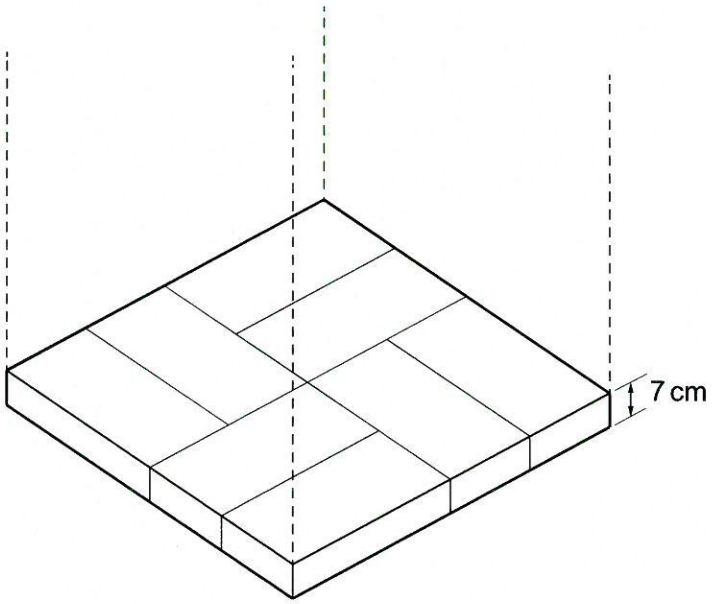
TB 71

Examiner only

(d) The gardener has a stack of bricks to build a barbeque.
The stack is 154 cm tall.

Each layer of bricks has the pattern shown below.



The thickness of one layer of bricks is 7 cm.
How many bricks are there in the stack altogether? [4]

4 1/4 7 2

Recipes

F+I Maths Num U2 8 June 2017

Examiner only

6. *(a)* Gustav is making some scones for his sister's birthday party.

Recipe to make 12 scones

450g self raising flour
2 teaspoons of baking powder
75g butter
50g caster sugar
2 eggs
225ml milk

Bake at **428°F** for 10 to 15 minutes

(i) How much self raising flour will Gustav need to make 30 scones?
Circle your answer. [1]

900g 1000g 1100g 1125g 1350g

(ii) In the recipe, the temperature of the oven is given in degrees Fahrenheit, *F*.
The temperature gauge on Gustav's oven shows degrees Celsius, *C*.

The formula below is used to convert Fahrenheit into Celsius.

$$C = \frac{5F - 160}{9}$$

At what temperature should Gustav bake the scones?
Give you answer in degrees Celsius. [2]

..... °C

Examiner only

6. Sam is making a large pot of cheese sauce for a party.
Sam uses the conversions

- 1 ounce ≈ 28 grams,
- 1 pint ≈ 568 millilitres.

He wants to write the following recipe ingredients in grams and millilitres.

<u>Cheese sauce</u>

Ingredients:

4 ounces of butter

$3\frac{1}{2}$ ounces of flour

3 pints of milk

9 ounces of cheese

Using Sam's conversions, complete the ingredient table below. [4]

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<u>Cheese sauce</u>

Ingredients:

..... grams of butter

..... grams of flour

..... millilitres of milk

..... grams of cheese

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Examiner only

3. Mair has an old family recipe for making Welsh cakes.

Ingredients for 10 Welsh cakes

8 ounces plain flour
4 ounces butter
3 ounces caster sugar
2 ounces currants
1 egg

(a) Mair wants to make 40 Welsh cakes.
Complete the recipe. [1]

Ingredients for 40 Welsh cakes

32 ounces plain flour

..... ounces butter

12 ounces caster sugar

..... ounces currants

4 eggs

(b) Flour is sold in packs weighing one kilogram each.
Mair knows that she needs 2 pounds of flour to make 40 Welsh cakes.
Is a one kilogram pack of flour enough?
Give a reason for your answer. [1]

Examiner only

(c) Mair sells Welsh cakes to a tearoom.
She sells 40 Welsh cakes every week for 12 weeks.
The weekly cost of making the Welsh cakes is £4.50.
She charges the tearoom 25p for each Welsh cake.
How much profit does Mair make in total over the 12 weeks?
Give your answer in £. [4]

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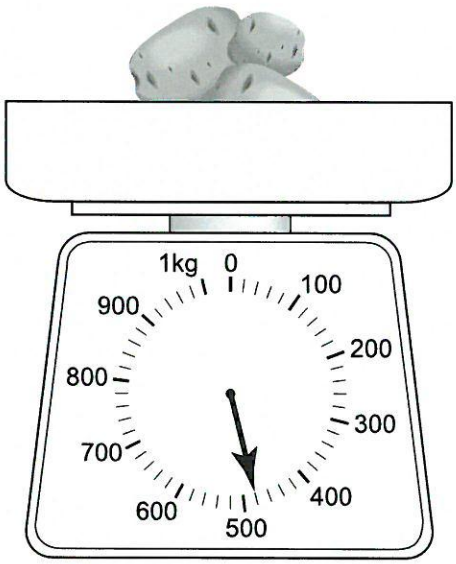
Profit = £ .....

Examiner only

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]

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Extra mass of potatoes needed is ..... grams

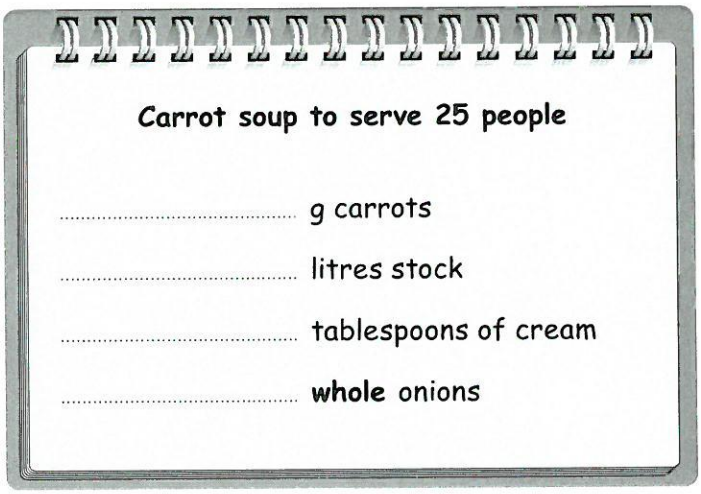
Examiner only

(b) Edmund plans to use the recipe shown to make soup.

Carrot soup, serves 4 people

450g carrots
0·8 litres stock
4 tablespoons of cream
2 onions

He starts to write the recipe for serving 25 people.



Edmund does not want part of an onion left over.
Complete the recipe for Edmund. [3]