Surname StemUp Model Solution	Centre Number	Candidate Number
First name(s)		0

GCSE

3310U10-1

A19-3310U10-1

TUESDAY, 5 NOVEMBER 2019 – MORNING

MATHEMATICS – NUMERACY
UNIT 1: NON-CALCULATOR
FOUNDATION TIER

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 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**, 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.	8	
3.	10	
4.	7	
5.	4	
6.	7	
7.	4	
8.	5	
9.	3	
10.	4	
11.	6	
12.	3	
Total	65	

3310U101
01

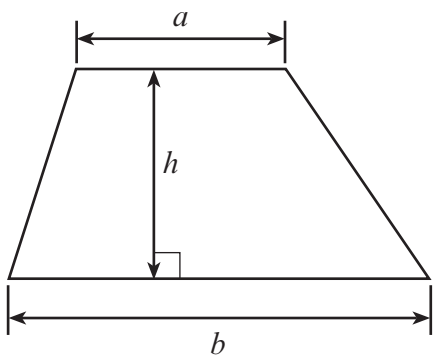
NOV193310U10101

© WJEC CBAC Ltd.

CJ*(A19-3310U10-1)

Formula List - Foundation Tier

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



© WJEC CBAC Ltd.

stemup.co.uk

Examiner only

1. Tina is opening a day-care business for children, called *Tina's Tots*.

In Wales, to look after children, there must be:

- 1 adult for up to 3 children under 2 years of age,
- 1 adult for up to 4 children aged 2 years,
- 1 adult for up to 8 children aged 3 to 7 years.

The ages of the children that will be attending *Tina's Tots* are:

0 years 6 months	7 years	0 years 8 months
7 years	1 year 1 month	4 years
1 year 6 months	3 years	0 years 5 months
5 years	4 years	7 years
6 years	2 years	3 years
0 years 4 months	5 years	0 years 9 months
2 years	0 years 4 months	1 year

By completing the table below, calculate the total number of adults needed to look after these children. [4]

Age in years	Under 2	2	3 to 7
Number of children	9	2	10
Number of adults	3	1	2

Under 2: 9 children, 1 adult for every 3, so 9 ÷ 3 = 3 adults

Aged 2: 2 children, 1 adult for up to 4, so 1 adult

Aged 3 to 7: 10 children, 1 adult for up to 8, so 2 adults. 3 + 1 + 2 = 6

Total number of adults needed = 6

3310U101 03

© WJEC CBAC Ltd.

stemup.co.uk

Examiner only

2. *(a)* The show, *Joseph and The Amazing Technicolor Dreamcoat*, is on at the theatre.

(i) The show starts at 7:30 p.m.
The show is in 2 acts.
Act 1 is 42 minutes long.
There is an interval of 20 minutes.
Act 2 is 48 minutes long.

At what time will the show end? [4]

Total length = Act 1 + interval + Act 2

= 42 + 20 + 48 = 110 minutes

110 minutes = 1 hour 50 minutes

7:30 p.m. + 1 hour = 8:30 p.m.

8:30 p.m. + 50 minutes = 9:20 p.m.

The show will end at 9:20 p.m.

(ii) Mr and Mrs Hanbury book seats for the show.

Mr and Mrs Hanbury's tickets are shown below.

Ticket for:
Joseph and The Amazing Technicolor Dreamcoat
Stalls
Row G
Seat 15

Ticket for:
Joseph and The Amazing Technicolor Dreamcoat
Stalls
Row G
Seat 16

Circle these seats on the seating plan of the theatre shown on the next page. [1]

© WJEC CBAC Ltd.

stemup.co.uk

Examiner only

Circle

H	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
G			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
F			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
E			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
D			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
C			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
B			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
A			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		

Stalls

K	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
J			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
H			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
G			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
F			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
E			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
D			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
C			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
B			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
A			♿	♿	3	4	5	6	7	8	9	10	11	12	13	14	15	16	♿	♿		

Pit

CC	1	2	3	4	5	6	7	8	9	10	11	12
BB		1	2	3	4	5	6	7	8	9	10	
AA			1	2	3	4	5	6	7	8		

Stage

3310U101
05

© WJEC CBAC Ltd.

stemup.co.uk

Examiner only

(b) In a survey, people were asked, "Have you been to any arts events in Wales in the last year?"
The percentages of people answering "Yes" or "No" were calculated.
The results for some local authorities are shown in the table below.

Local Authority	**Yes %**	**No %**
Isle of Anglesey	**60**	**40**
Conwy	**64**	**36**
Flintshire	**56**	**44**
Powys	**58**	**42**
Pembrokeshire	**57**	**43**
Swansea	**56**	**44**
Bridgend	**58**	**42**
Cardiff	**67**	**33**
Merthyr Tydfil	**47**	**53**
Blaenau Gwent	**46**	**54**
Monmouthshire	**61**	**39**

Use the information in the table to answer the following questions.

(i) Which local authority has the largest percentage of people who answered "Yes"? [1]

Cardiff (67%)

(ii) How many local authorities have a greater percentage of people answering "No" rather than "Yes"? [1]

Merthyr Tydfil (53% > 47%) and Blaenau Gwent (54% > 46%)

2

(iii) What is the range of the percentage of people who answered "No"? Circle your answer. [1]

33% 21% 44% 11% 54%

Range = 54 − 33 = 21%

© WJEC CBAC Ltd.

stemup.co.uk

Examiner only

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

Cai wants to buy a new computer.
The total cost of the computer is £400.

Cai's parents give him 15% of the cost of the computer.

Cai's grandparents give him $\frac{2}{5}$ of the cost of the computer.

Cai saves £30 each month.

How many months will it take Cai to save enough money to buy the computer? [8 + 2 OCW]

Money from Cai's parents = 15% of £400

10% of £400 = £40, 5% of £400 = £20

So 15% of £400 = £40 + £20 = £60

Money from Cai's grandparents = $\frac{2}{5}$ of £400

£400 ÷ 5 = £80, so 2 × £80 = £160

Total money given to Cai = £60 + £160 = £220

Amount Cai still needs to save = £400 − £220 = £180

Number of months = £180 ÷ £30 = 6 months

Check: 6 × £30 = £180, and £220 + £180 = £400

It will take Cai 6 months to save enough money to buy the computer.

3310U101 07

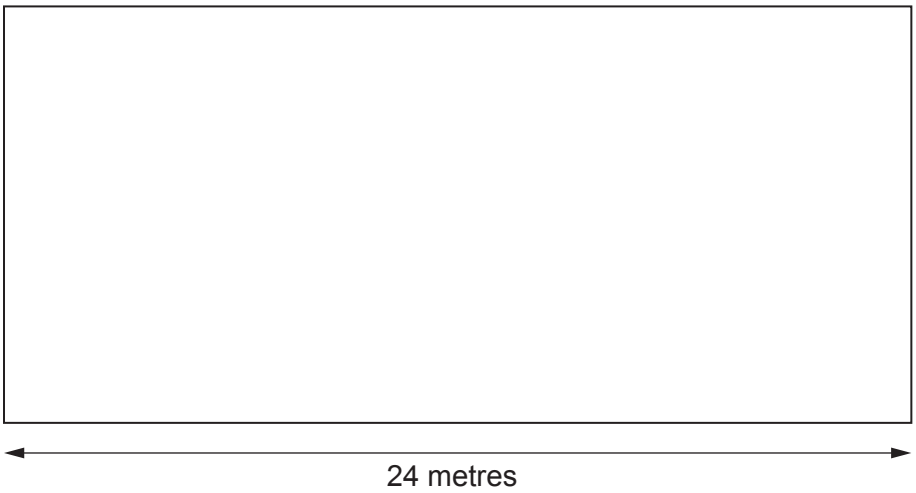
© WJEC CBAC Ltd.

stemup.co.uk

Examiner only

4. *(a)* *The Marine Tennis Club* has 6 tennis courts.
Each court is rectangular in shape.

The diagram below is **a scale drawing** of one of the tennis courts.



The actual length of the tennis court is 24 metres.

Using a ruler to measure the length of the scale diagram, find the **actual width** of the tennis court. [3]

Length on diagram = 12 cm, so 12 cm represents 24 m and 1 cm represents 2 m

Width on diagram = 5.5 cm

Actual width = 5.5 × 2 = 11 m

(b) (i) *The Marine Tennis Club* and *The Bay Tennis Club* have already played matches against 8 other clubs this season.

The table shows the results of these matches.

	Won	Lost
The Marine Tennis Club	3	5
The Bay Tennis Club	6	2

The Marine Tennis Club are playing *The Bay Tennis Club* in their next match.

It is **not possible** to tell from the information in the table which team is more likely to win the match. Give one reason why it is not possible. [1]

They have played against different clubs, so the results do not show which of these two teams is better when they play each other.

© WJEC CBAC Ltd.

stemup.co.uk

Examiner only

(ii) The match between the two clubs will take place on 24th November 2019.

NOVEMBER **2019**

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

The table shows when players are available to play.
The club needs 6 players for the match.

Using the end column in the table below, tick the 6 players who should be available on 24th November. [2]

Player	Days they can play	Players available on 24th November
Caroline	Tuesday and Friday	
Tracey	Every day	✓
Lisa	Weekends	✓
Sian	Monday, Tuesday and Friday	
Jan	Every day	✓
Heather	Monday to Friday	
Alys	Wednesday and Friday	
Nafeesa	Tuesday, Friday and Sunday	✓
Molly	Wednesday and Sunday	✓
Alicia	Tuesday and Weekends	✓

3310U101 09

(c) Which of the following is the best description for the shape of a tennis ball? Circle your answer. [1]

Cone Cube Cuboid Sphere Cylinder

© WJEC CBAC Ltd.

stemup.co.uk

Examiner only

5. Tractors need to have tyres of the correct size.
All tyres have codes on them.
The code on a tractor's front tyre is 320/85R20.
The '320' means that the tyre is 320 mm wide.

(a) What is 320 mm in cm? [1]

320 mm ÷ 10 = 32 cm

(b)

A company that sells the tractor tyres stacks them one on top of each other.
For safety reasons the piles are no more than 2 metres high.
What is the greatest number of tyres that can be stacked safely in a single pile? [3]

2 metres = 200 cm. Each tyre is 32 cm high: 200 ÷ 32

32 × 6 = 192 cm (192 is less than 200, so this is safe)

32 × 7 = 224 cm (224 is more than 200, too high)

So the greatest number of tyres is 6.

Greatest number of tyres is 6

© WJEC CBAC Ltd.

stemup.co.uk

Examiner only

6. Every year, *Aber Young Farmers* club organises a sponsored walk.

(a) This year, the length of the walk is 20 miles.
Calculate the length of the walk in km. [2]

5 miles ≈ 8 km

20 miles = 4 × 5 miles

Length of walk = 4 × 8 = 32 km

(b) Last year, the walk raised a total of £3600.
It cost £180 to organise the walk last year.
Give the cost of organising the walk as a percentage of the total raised. [2]

Percentage $= \frac{180}{3600} \times 100 = \frac{1}{20} \times 100$

= 5%

The cost of organising was 5% of the total raised.

(c) This year, walkers will be charged to take part.
Aber Young Farmers decided that:

charge in pence = 3 × height of the walker in cm

What is the height of the shortest walker who will need to pay a charge of more than £5?
Give your answer correct to the nearest cm.
You must show all your working. [3]

£5 = 500p, so 3 × height > 500

Height > 500 ÷ 3 = 166.66... cm

Check: 166 × 3 = 498p = £4.98 (not more than £5)

167 × 3 = 501p = £5.01 (more than £5)

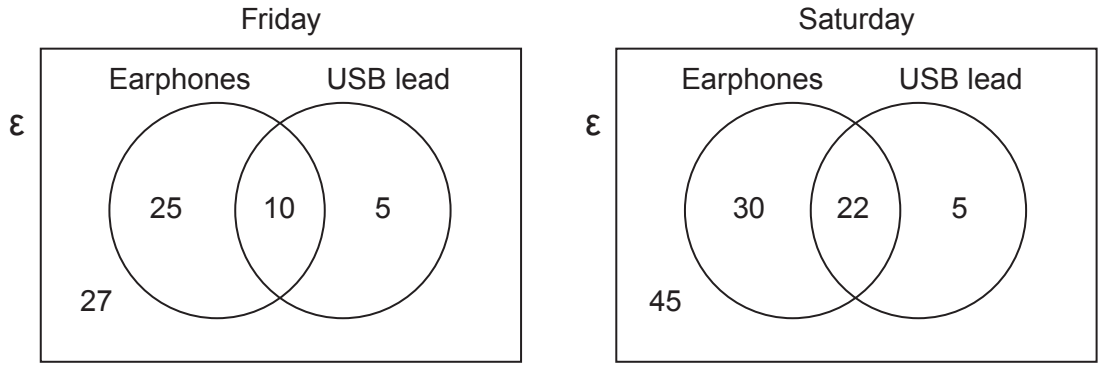
Height of the shortest walker = 167 cm

© WJEC CBAC Ltd.

stemup.co.uk

Examiner only

7. *Sound5* sells pairs of earphones and USB leads.
The Venn diagrams show the number of customers who visited the shop last Friday and last Saturday.
No customers visited the shop on both days.
No customers bought more than 1 pair of earphones and 1 USB lead.



Earphones sell for £15 and USB leads sell for £3.

(a) How much did *Sound5* customers spend buying USB leads on **Friday**? [2]

Number of Friday customers buying a USB lead = 10 + 5 = 15

Amount spent on USB leads = 15 × £3 = £45

(b) Over the two days, how many customers did **not** buy either earphones or a USB lead? Circle your answer. [1]

27 45 40 57 72

Friday 27 + Saturday 45 = 72

© WJEC CBAC Ltd.

stemup.co.uk

Examiner only

(c) What fraction of **Friday**'s customers bought both earphones and a USB lead? Circle your answer. [1]

$\frac{1}{10}$ $\frac{1}{4}$ $\frac{10}{40}$ $\frac{10}{67}$ $\frac{40}{67}$

Friday customers = 25 + 10 + 5 + 27 = 67, both = 10

Fraction = $\frac{10}{67}$

© WJEC CBAC Ltd.

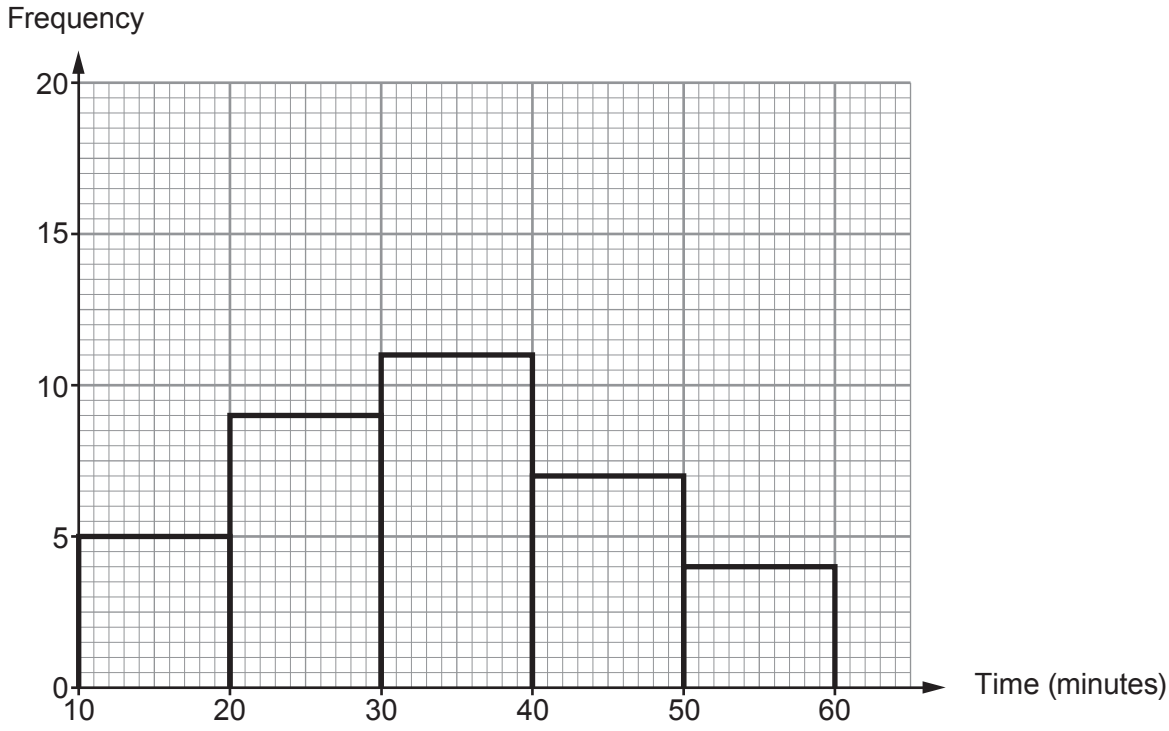
stemup.co.uk

Examiner only

8. The students in Mr Griffin's mathematics class all recorded how long they spent on their last mathematics homework.
None of his students spent less than 10 minutes on this homework.
All of his students attempted the homework.

Mr Griffin has drawn a frequency diagram to display the times recorded by his students.
He used groups of width 10 minutes:

$$10 \leqslant \text{time} < 20, \quad 20 \leqslant \text{time} < 30, \quad \text{and so on.}$$



(a) Did any student get all their mathematics homework correct?

Yes ☐ No ☐ Can't tell ☑

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

Can't tell, because the diagram only shows the time each student spent on the homework. It does not show their marks or if their answers were correct.

© WJEC CBAC Ltd.

stemup.co.uk

Examiner only

(b) How many students are there in Mr Griffin's mathematics class? [2]

Number of students = 5 + 9 + 11 + 7 + 4 = 36

There are 36 students in the class.

(c) Consider the students who spent less than 40 minutes on their homework.
What fraction of these students spent 30 minutes or more on their homework? [2]

Less than 40 minutes: 5 + 9 + 11 = 25 students

30 minutes or more (30 ≤ time < 40): 11 students

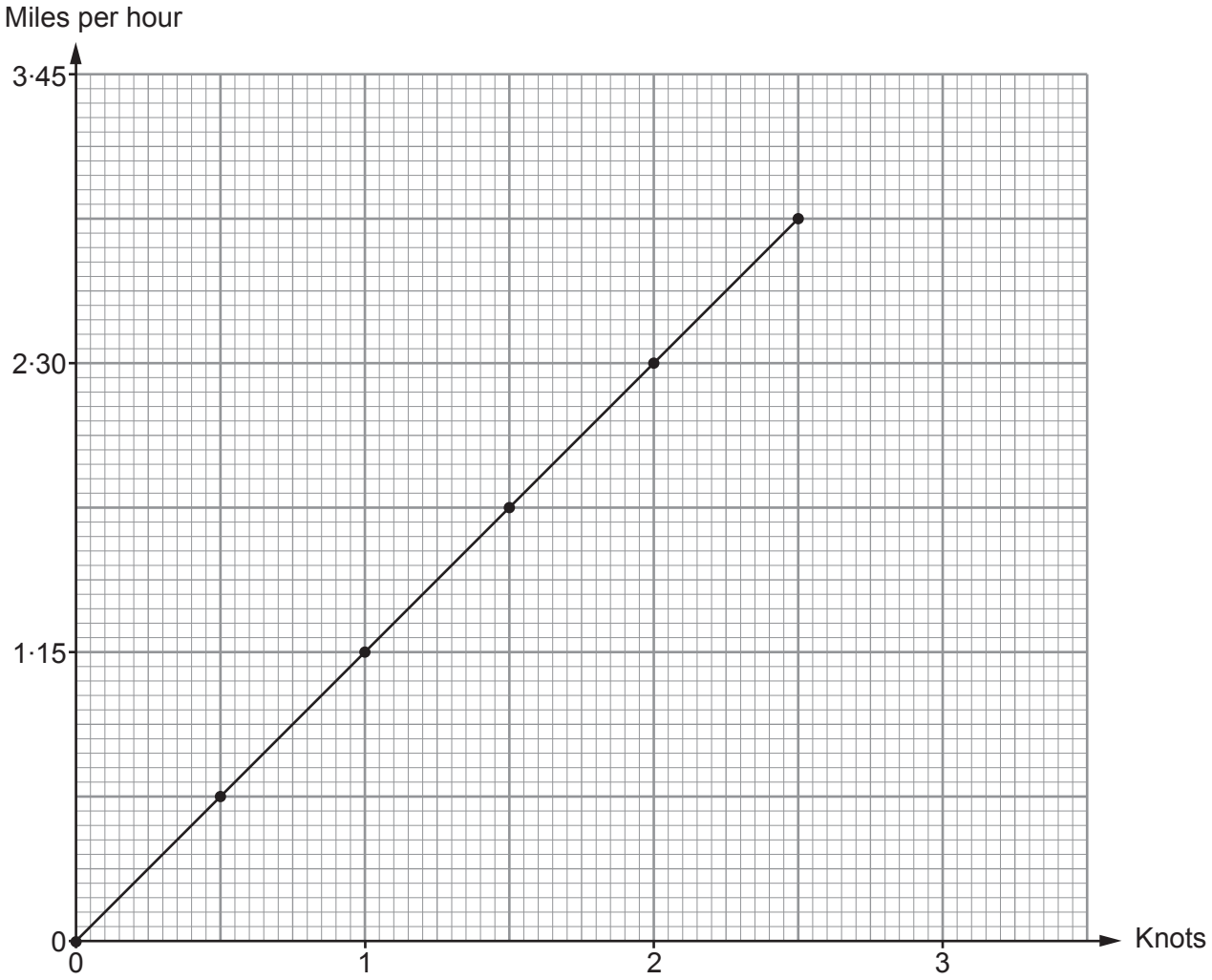
Fraction = $\frac{11}{25}$

© WJEC CBAC Ltd.

stemup.co.uk

Examiner only

9. Emily has drawn a conversion graph, as shown below.
She uses it to help her brother understand how to convert knots to miles per hour.



Complete each of the following statements.

(a) 23 miles per hour is equal to ....20.... knots. [1]

2 knots = 2.30 miles per hour, so 20 knots = 23.0 miles per hour

(b) 5 knots is equal to ....5.75.... miles per hour. [2]

5 knots = 2 knots + 2 knots + 1 knot

= 2.30 + 2.30 + 1.15 = 5.75 miles per hour

© WJEC CBAC Ltd.

stemup.co.uk

Examiner only

10. Ms Logan is calculating her next water bill.
She knows that her fresh water usage is 20 m^3.

On the water company's website she finds the following:

Water charges

- The waste water output is calculated as 80% of the fresh water usage.
- Fresh water usage costs £1.10 per m^3.
- Waste water output costs £1.50 per m^3.

Calculate Ms Logan's water bill. [4]

Fresh water cost = 20 × £1.10 = £22

Waste water output = 80% of 20 m^3 = 0.8 × 20 = 16 m^3

Waste water cost = 16 × £1.50

= 16 × £1 + 16 × 50p = £16 + £8 = £24

Total water bill = £22 + £24 = £46

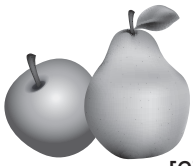
Ms Logan's water bill is £46.

© WJEC CBAC Ltd.

stemup.co.uk

Examiner only

11. Liam buys 3 kg of apples and 2·5 kg of pears.
Pears cost £3.40 per kilogram.
Liam pays a total of £12.40 for the apples and pears.



Calculate the cost of one kilogram of apples. [6]

Cost of pears = 2.5 × £3.40

2 × £3.40 = £6.80, 0.5 × £3.40 = £1.70

So cost of pears = £6.80 + £1.70 = £8.50

Cost of apples = £12.40 − £8.50 = £3.90

Cost of 1 kg of apples = £3.90 ÷ 3 = £1.30

Check: 3 × £1.30 + £8.50 = £3.90 + £8.50 = £12.40

One kilogram of apples costs £1.30.

© WJEC CBAC Ltd.

stemup.co.uk

Examiner only

12. Waldo doesn't mind which type of pasta he buys.

In the supermarket, Waldo sees the three packets of pasta shown below.

Strozzapreti pasta	Fusilli pasta	Rigatoni pasta
500g for £1.25	400g for 96p	250g for 65p

Which pasta offers Waldo the best value for money?
You must show all your working. [3]

Compare the cost of 100 g of each pasta:

Strozzapreti: 500 g for 125p, 125 ÷ 5 = 25p per 100 g

Fusilli: 400 g for 96p, 96 ÷ 4 = 24p per 100 g

Rigatoni: 250 g for 65p, 500 g costs 2 × 65 = 130p,

130 ÷ 5 = 26p per 100 g

24p < 25p < 26p

Fusilli pasta offers Waldo the best value for money.

END OF PAPER

© WJEC CBAC Ltd.

stemup.co.uk

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

© WJEC CBAC Ltd.

stemup.co.uk