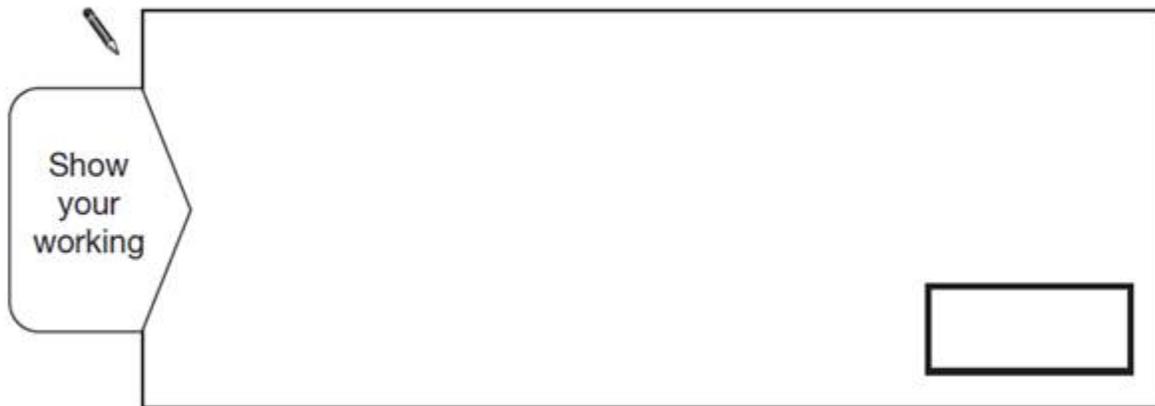**1** Amy thought of a number.

She added 0.5 to her number and then doubled the result.

Then she subtracted 0.5 and doubled the new result.

Her final answer was 61.

What number did Amy start with?

Show your working

2 marks

2 The rule to get each number in a sequence is

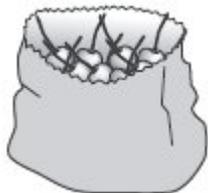| subtract the previous number from 100, then **divide** the answer by 2 |

Here is part of the sequence.

Write the two missing numbers.

40   30   35   32.5   33.75

2 marks

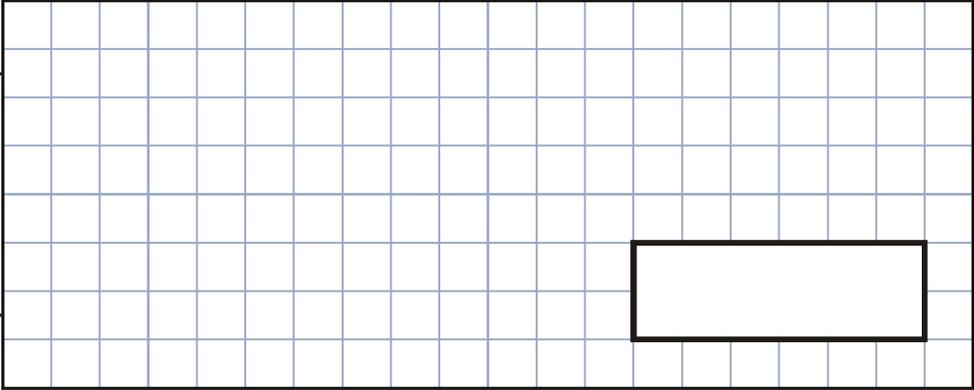**3** Sarah had a bag of cherries.

She ate 5 cherries, then gave half of what she had left to Liam.

Liam ate 5 of his cherries, then gave half of what he had left to Amy.

Amy got 2 cherries.

How many cherries did Sarah have in her bag at the start?

Show your method

2 marks

4 Here are five number cards.

| 0.47 | 10 | 100 | 1000 | 4.07 |

Use **four** of the cards to complete these calculations.

$$47 \div \boxed{} = \boxed{}$$

$$\boxed{} \times \boxed{} = 40.7$$

1 mark

5 $23.8 \div 1000 =$

1 mark

6 $6.7 \div 100 =$

1 mark

7 Write the missing fraction.

$$\frac{1}{3} \;+\; \frac{1}{4} \;+\; \boxed{} \;=\; 1$$
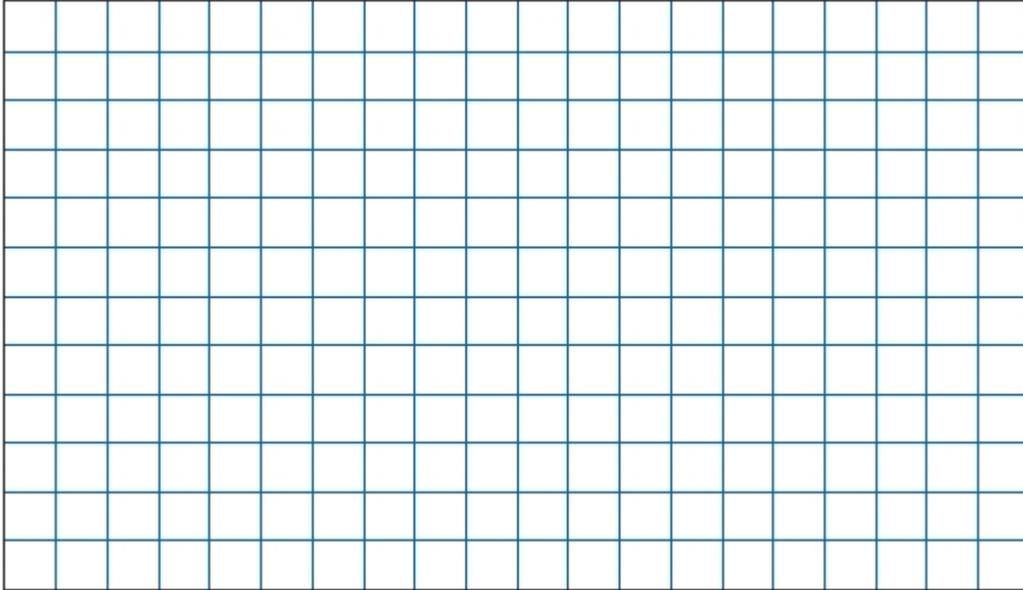
8 In this diagram, the number in each box is the **sum** of the two numbers below it.

Write the missing numbers.

Top box: (blank)

Second row: $2\frac{3}{4}$ | $3\frac{1}{2}$

Bottom row: (blank) | $1\frac{1}{4}$ | $2\frac{1}{4}$
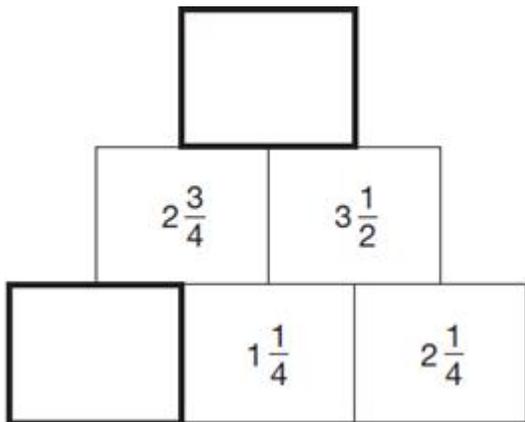
9 The cost to hire a boat on a lake is worked out using the information below.

Cost to hire a boat:
£4.50 per boat
and then
£3.50 per hour

BOAT HIRE

(a) Four friends hire a boat for five hours.

They share the cost equally.

How much does **each** person pay?

Show your method

£

2 marks

Chen's family hires a boat and pays a total of £15

How many hours did they have the boat for?

hours

1 mark

10 Calculate **(47.9 + 71.8) ÷ (6.65 × 2)**

1 mark

11 Calculate **1.2 × (1.3 + 1.4) × 1.5**

1 mark

12 Calculate **900 ÷ (45 × 4)**

1 mark

13 Put a tick (✔) in the correct box for each calculation.

Use a calculator.

The first one has been done for you.

	less than 1000	equal to 1000	more than 1000
8.9 × 9.9 × 11.9			✔
(786 – 387) ÷ 0.41			
95.4 + (91 × 9.95)			
12.5 × (21.1 + 58.9)			

2 marks

14 Write **all** the numbers between 50 and 100 that are **factors of 180**

....

2 marks

15 364 is a multiple of 7 but not a multiple of 3.

384 is a multiple of 3 but not a multiple of 7.

Find a number between 364 and 384 that is **both** a multiple of 7 **and** a multiple of 3.

Show your method

2 marks

16 Chen chooses a **prime** number.

He multiplies it by 10 and then rounds it to the nearest hundred.

His answer is **400**.

Write **all** the possible prime numbers Chen could have chosen.

....

2 marks

17 The numbers in this sequence increase by 7 each time.

$$1 \qquad 8 \qquad 15 \qquad 22 \qquad 29 \qquad ....$$

The sequence continues in the same way.

Will the number 777 be in the sequence?

Circle **Yes** or **No**.

Yes / No

Explain how you know.

1 mark

18 A sequence of numbers starts at 11 and follows the rule

'double the last number and then subtract 3'

$$11 \qquad 19 \qquad 35 \qquad 67 \qquad 131 \; ...$$

The sequence continues.

The number 4099 is in the sequence.

Calculate the number which comes immediately **before 4099** in the sequence.

Show your method

2 marks

19 Runa nd Jon each start with the same number.

Runa rounds the number to the nearest hundred.

Jon rounds the number to the nearest ten.

Runa's answer is double Jon's answer.

Explain how this can be.

1 mark

20 Write the answer to each of these calculations rounded to the **nearest whole number**.

One has been done for you.

	To the nearest whole number
75.7 × 59	4466
7734 ÷ 60	
772.4 × 9.7	
20.34 × (7.9 − 5.4)	

2 marks

21 Write these in order of size, starting with the smallest.

$$\frac{2}{3} \qquad 0.5 \qquad \frac{3}{5} \qquad 0.65$$

smallest

1 mark

22 Circle the fraction that is greater than $\frac{1}{2}$ but less than $\frac{3}{4}$

$$\frac{7}{8} \qquad \frac{2}{5} \qquad \frac{1}{3} \qquad \frac{5}{8} \qquad \frac{3}{6}$$

1 mark

23 Write in the missing numbers.

One is done for you.

$$0.321 \quad = \quad \frac{\boxed{321}}{1000} \qquad\qquad 2.433 \quad = \quad \frac{\boxed{}}{1000}$$

$$\boxed{} \quad = \frac{457}{1000} \qquad\qquad \boxed{} \quad = \frac{23}{1000}$$

2 marks

24 Circle the number that is closest to 20.

19.95   20.1   19.09   20.09   20.201

1 mark

25 $30\% = \frac{?}{20}$

1 mark

26

$0.2 = \dfrac{?}{50}$

<div style="border:1px solid black; width:200px; height:90px;"></div>

1 mark

27

$96\% = \dfrac{?}{25}$

<div style="border:1px solid black; width:200px; height:90px;"></div>

1 mark

28 Calculate **55% of 640**.

1 mark

29

Chen is cooking some pasta.

The recipe says he needs 350 grams of pasta for 4 people.

How many **kilograms** of pasta does he need for **12 people**?
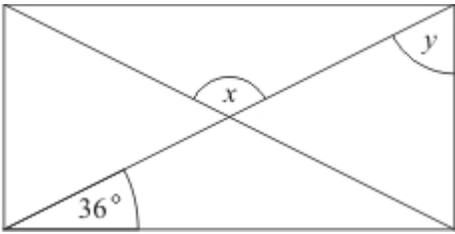
Show your working

kg

2 marks

30 The diagram shows a rectangle.

Calculate angles x and y.

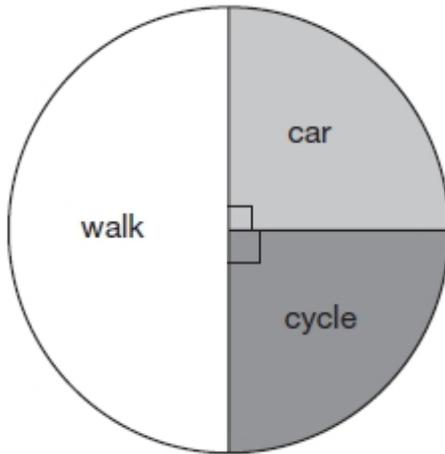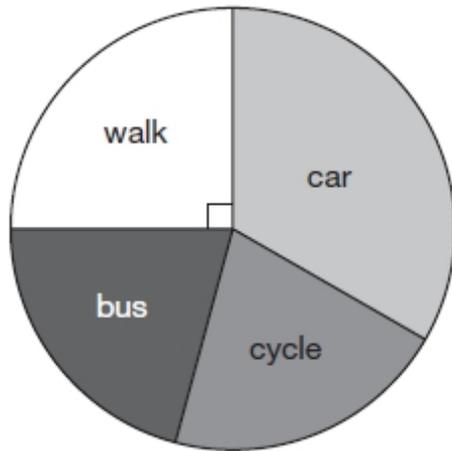$x =$ [ ] °

$y =$ [ ] °

2 marks

31 Megan asked children from two different schools,

'How do you travel to school?'

Here are her results.

Foxwood school
80 children
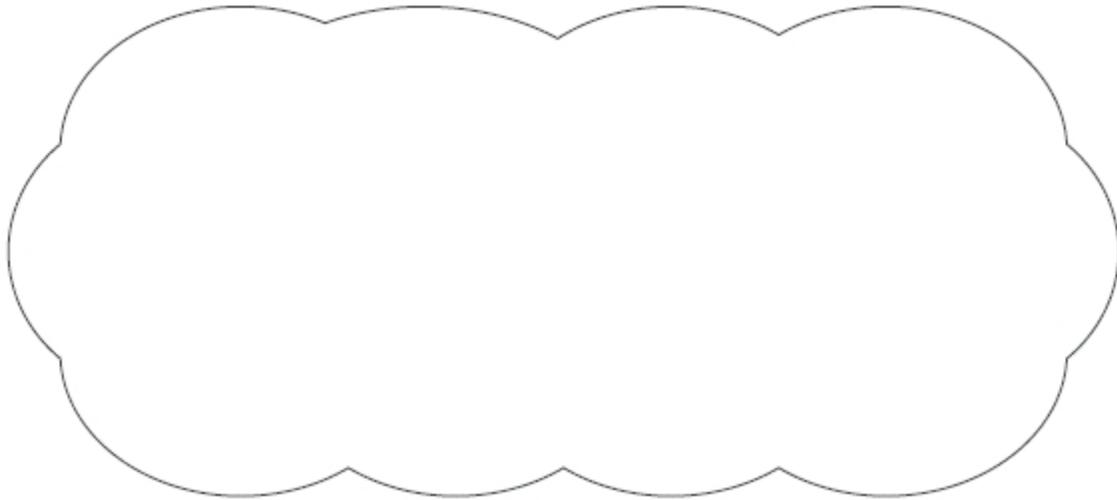

Midtown school
240 children

Megan says,

*'The number of children walking to Foxwood school is
more than the number walking to Midtown school.'*

Is she correct?
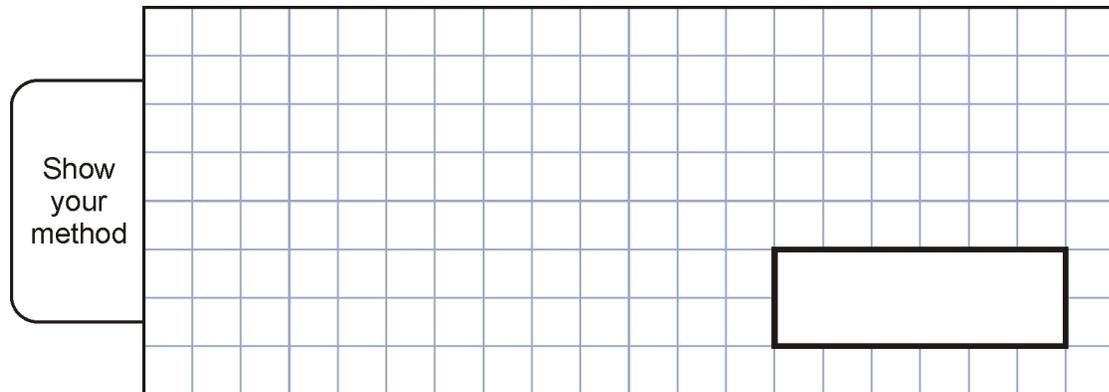Circle **Yes** or **No**.

Yes / No

Explain how you know.
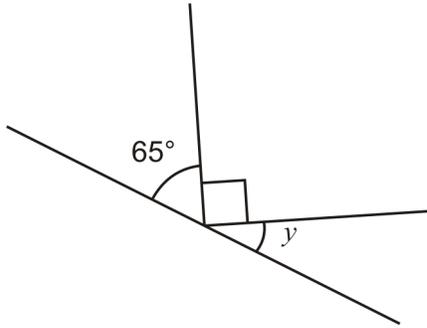
At Midtown school, one third of children travel by car.

The number of children who cycle is the same as the number who go on the bus.

How many children **cycle** to Midtown school?

Show your method

32

65°

y

Not to scale

Calculate the size of angle *y* in this diagram.

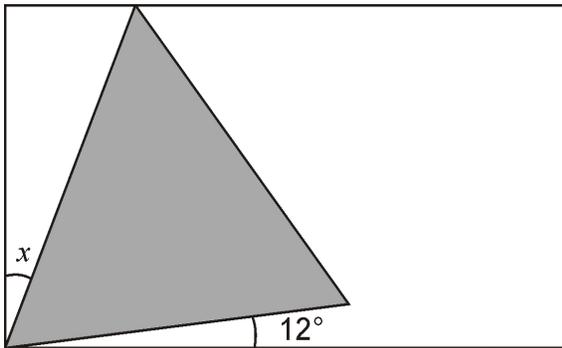Do **not** use a protractor (angle measurer).

y =° [   ] °

1 mark

33

Here is an **equilateral triangle** inside a **rectangle**.

x

12°

Not to scale

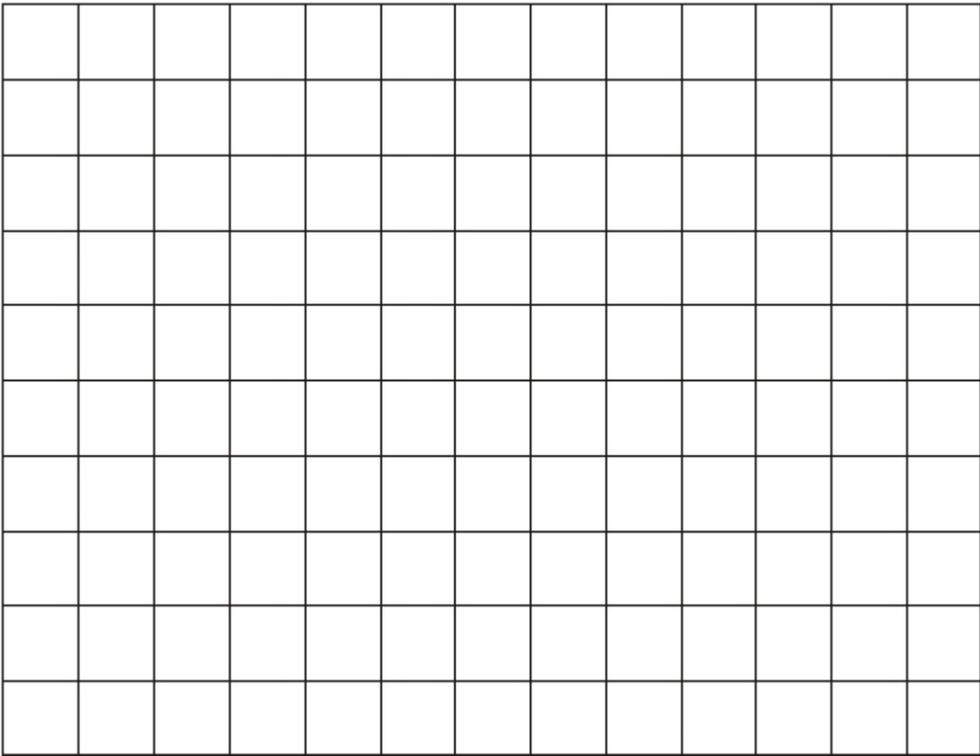Calculate the value of angle *x*.

Do **not** use a protractor (angle measurer).

Show your method

[   ] °

2 marks

34 On the grid below, use a ruler to draw a **pentagon** that has **three right angles**.

1 mark

35

One toffee apple needs:

1 stick,

100g of sugar,

1 apple.

50 sticks cost £6.25

1 kg of sugar costs £0.99

100 apples cost £22.50

Children buy just enough sticks, sugar and apples to make **100** toffee apples.

They sell all 100 toffee apples for **£1 each**.

The profit goes to charity.

Work out how much money goes to charity.

Show your method

£

3 marks

36 A shop sells drinks.

The pie chart compares the money a shop took last year for water, juice and soft drinks.

Key:

Water

Juice

Soft drinks

The shop took £8264 for soft drinks.

Sales of water and juice were **equal**.

How much money did the shop take for **juice** last year?

Show your method

£

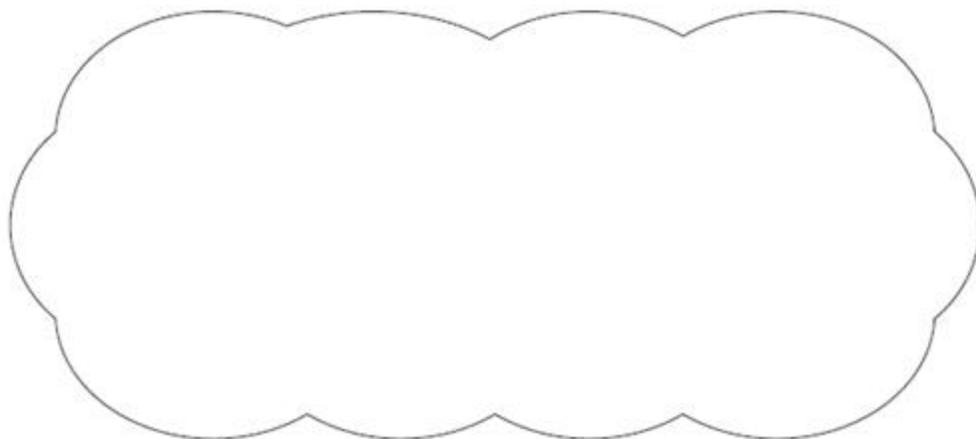2 marks

37 Alfie says,

> *'When you multiply two numbers together, the answer is always greater than either of the numbers you started with.'*

Is Alfie correct?
Circle **Yes** or **No**.

✎ Yes / No

Explain how you know.

✎

1 mark

38 Megan and Chen each have a bag of counters.

Megan's bag has **5** blue counters and **5** green counters.

Chen's bag has **10** blue counters, **5** green counters and **5** red counters.

Megan's bag   Chen's bag

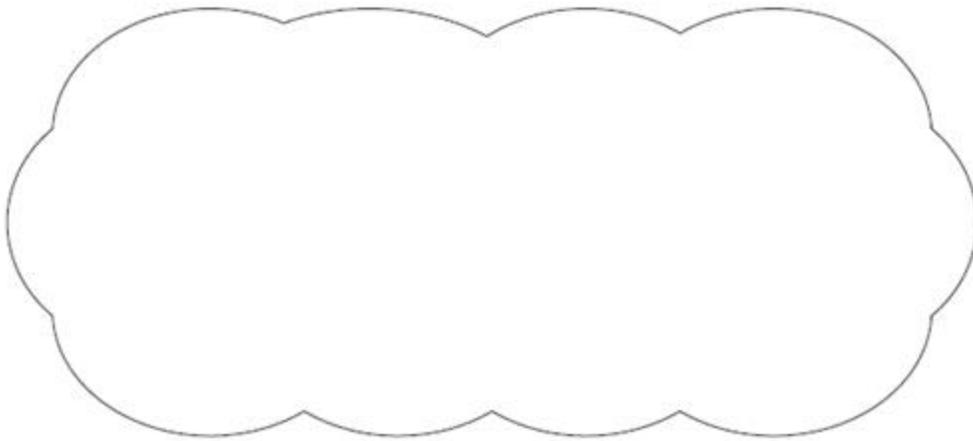They each take a counter from their bag without looking.

Chen says,

'I am more likely than Megan to take a blue counter.'

Is Chen correct?
Circle **Yes** or **No**.

Yes / No

Explain how you know.

1 mark

Mark schemes

1 Award **TWO** marks for the correct answer of 15

If the answer is incorrect, award **ONE** mark for evidence of appropriate working, eg:

■   61 ÷ 2 = 30.5

30.5 + 0.5 = 31

31 ÷ 2 = 15.5

15.5 − 0.5 = wrong answer

OR

■   61 ÷ 2 = 30.5

30.5 − 0.5 = 30 (step error)

30 ÷ 2 = 15

15 − 0.5 = 14.5 (wrong answer)

Working must be carried through to reach an answer for the award of ONE mark.

Up to 2m

[2]

2 20

1

33.125

Accept equivalent fractions or decimals

1
U1

[2]

3 Award **TWO** marks for the correct answer of 23

If the answer is incorrect, award **ONE** mark for evidence of appropriate working, eg

2 × 2 = 4

4 + 5 = 9

9 × 2 = 18

18 + 5 = wrong answer

Working must be carried through to reach an answer for the award of ONE mark.

Up to 2 (U1)

[2]

4   47 ÷ | **100** | = | **0.47** |

AND

| **4.07** | × | **10** | = **40.7** |

Numbers within calculations may be given in either order.

[1]

5   0.0238

[1]

6   0.067

[1]

7 $\frac{5}{12}$

[1]

8

(a) $6\frac{1}{4}$

Accept equivalent fractions.

***Do not** accept* $5\frac{5}{4}$

1

(b) $1\frac{1}{2}$

Accept equivalent fractions, eg

$1\frac{2}{4}$, $\frac{3}{2}$, *1.5, 150%*

1

[2]

9   (a)   5.50

! Money
For 2m and 1m, do not accept misreads of numbers given as words, eg:
- *four instead of five*

2

or

22 seen

OR

Shows or implies a complete, correct method, eg:

- c = £4.50 + £3.50 × 5
  = £4.50 + £17.50 = £21 (error)
  £21 ÷ 4

  ! For 1m, accept answers with incorrect or ambiguous units as evidence of a correct method, eg:
  - *£550*
  - *£550 p*
  - *£5.5*

  ! Correct embedded solutions

  For 1m, condone a response which shows £5.50 embedded irrespective of how it is obtained

  ***Do not accept** incomplete methods, eg:*
  - *3.50 × 5 = 17.50*
  - *14.50 ÷ 4 = 3.63*

  1

(b) 3

  1

  [3]

10 9

  [1]

11 4.86

  [1]

12 5

  [1]

13 Award **TWO** marks for the table correctly completed as shown:

		✓
✓		
		✓
	✓	

  ***Do not** accept any line which has two or more ticks in it.*

  Accept unambiguous alternatives to ticks, eg 'yes'.

  If the table is not correctly completed award **ONE** mark for any two out of three ticks correct.

  Up to 2

  [2]

14

Award **TWO** marks for the correct answer of 60 **AND** 90

Numbers may be given in either order.

If the answer is incorrect, award **ONE** mark for:

- both numbers correct and one or more additional factors of 180

eg 30, 45, **60**, **90**

OR

- both numbers correct and one number which is not a factor of 180

eg **60**, **90**, 100

OR

- one number correct and none incorrect.

eg **60**

Up to 2

[2]

15

Award **TWO** marks for the correct answer of 378

If the answer is incorrect, award **ONE** mark for
evidence of an appropriate method, eg:

- 366 369 372 375 378 381

  364 371 378 385

OR

- Factorisation/calculator method, eg

  7 × 3 = 21

  21 × 18

  *Answer need not be obtained for the award of **ONE** mark.*

Up to 2
U1

[2]

16

Gives only the three correct prime numbers in any order, ie:

- 37, 41, 43

2

or

Gives at least two correct prime numbers **and**
not more than one incorrect number, eg:

- 37, 39, 41, 43

- 39, 41, 43

- 41, 43

1

[2]

17 'No' is circled   **AND** one of the following:

 an explanation which recognises that 777 is not one more than a multiple of 7, eg:

- 'All the numbers are one more than a multiple of 7'

- 'There are no multiples of 7 in the sequence'

- '778 is in the sequence'

- '771 works but 777 doesn't'

OR

an explanation which recognises that 777 is a multiple of 7, eg:

- '777 is a multiple of 7'

- '777 ÷ 7 = 111'

OR

an explanation which relies solely on the start of the sequence, eg:

- 'The sequence started at 1'

- 'The sequence doesn't start at 0'.

> *'No' must be indicated for the award of the mark, unless a*
> ***complete*** *and correct explanation is given, eg:*
> - *'777 is a multiple of 7, and the numbers in the*
>   *sequence aren't'.*
>
> *No mark is awarded for circling 'No' alone.*
>
> ***Do not*** *accept vague or incomplete explanations, eg:*
> - *'It's adding 7 every time'*
> - *'There are no 7s in the sequence'.*

U1

[1]

18 Award **TWO** marks for the correct answer of 2051

If the answer is incorrect, award **ONE** mark for
evidence of appropriate method, eg

(4099 + 3) ÷ 2

OR

continuation of sequence, eg

259, 515, 1027, wrong number

*Answer need not be obtained for the award of **ONE** mark.*

Up to 2

[2]

19 Gives a correct explanation with a number x such that $50 \leq x < 55$, or $-5 < x < 5$,
as an example, eg:

• 53 to the nearest hundred is 100, and to the nearest ten is 50 and 2 × 50 = 100

• If it's 50 or more but less than 55 it will round to 100 (nearest hundred) and 50
(nearest ten) and 100 is double 50

• 0 is 0 to the nearest 100 and 0 to the nearest 10 and twice 0 is 0

Accept minimally acceptable explanation, eg:
• *51 rounds to 50 and 100*
• *54* → *50 and 54* → *100*
• *50 rounds to 100*
• *0 rounds to 0*

***Do not accept** incomplete or incorrect explanation, eg:*
• *They used 51*
• *50 × 2 = 100*
• *They could use between 50 and 55, which round to 100*

U1

[1]

20 Award **TWO** marks for all three numbers in order as shown:

129
AND
7492
AND
51

If the answer is incorrect, award **ONE** mark for two out of three numbers correct.

***Do not** accept 129.0 **OR** 7492.0 **OR** 51.0 **OR** any other equivalent*
answers with zeroes after the decimal point.

Up to 2

[2]

21 Numbers in order, as shown:

0.5 $\frac{3}{5}$ 0.65 $\frac{2}{3}$

Accept equivalent decimals, percentages or fractions.

[1]

22 Fraction circled as shown:

$\frac{7}{8}$ $\frac{2}{5}$ $\frac{1}{3}$ ⬭$\frac{5}{8}$⬬ $\frac{3}{6}$

Accept alternative unambiguous indications, eg fraction ticked, crossed or underlined.

[1]

23 All three correct

$$\frac{\boxed{2433}}{1000}$$

0.457

0.023

2

or

Any 2 correct

1

[2]

24 Number circled as shown:

(19.95)   20.1   19.09   20.09   20.201

Accept alternative unambiguous indications, eg number ticked, crossed or underlined.

[1]

25 6

[1]

26 10

[1]

27 24

[1]

28 352

Do not accept 352%

[1]

29 Award **TWO** marks for the correct answer of 1.05 kg.

If the answer is incorrect, award **ONE** mark for evidence of appropriate working, eg:

■   12 ÷ 4 = 3

350 × 3 = 1050

1050 ÷ 1000 = wrong answer

Do not accept 1050g

*Accept for **ONE** mark 10.5 or 105 as evidence of appropriate working.*

*Working must be carried through to reach an answer for the award of **ONE** mark.*

Up to 2m

[2]

30 $x = 108°$

1

$y = 54°$

1

[2]

31 (a)   An explanation that shows that one quarter
of 240 is more than one half of 80, eg:

•   'Because only 40 are walking to Foxwood
and 60 are walking to Midtown'

•   'Half of the people who walk is 40 and
a quarter of the people who walk is 60'

No mark is awarded for circling 'No' alone.

Do not accept vague or incomplete explanations, eg:

• *'Because at Foxwood it's a half and at
Midtown it's a quarter'*

• *'Because there are 80 children at Foxwood
and 240 children at Midtown'*

*If 'Yes' is circled but a correct unambiguous
explanation is given then award the mark.*

1
U1

(b)   Award **TWO** marks for the correct answer of 50

If the answer is incorrect, award **ONE** mark for
evidence of an appropriate method, eg

$240 \div 3 = 80$

$240 - 80 - 60 = 100$

$100 \div 2$

*Answer need not be obtained for the award of **ONE** mark.*

Up to 2

[3]

---

32   25

[1]

---

33   Award **TWO** marks for the correct answer of 18°

Calculation need not be performed for the award of the mark.
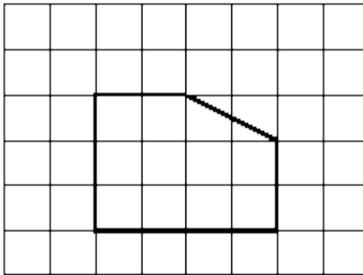
If the answer is incorrect, award **ONE** mark for evidence of an appropriate
method, eg $90 - 60 - 12$

Up to 2

[2]

---

34   Any pentagon which has three right angles, eg

*The shape need not follow grid lines. Allow slight inaccuracies
in drawing, provided the intention is clear*

[1]

35 Award **THREE** marks for the correct answer of £55.10

Award **TWO** marks for a complete correct method with one arithmetic error, eg

- Sticks   £12.50
  Sugar   £ 9.99 (error)
  Apples   + £22.50
  Total   £44.99

  Profit   £100.00
                  − £ 44.99
                   £ 55.01

OR

If the answer is incorrect, award **TWO** marks for evidence of a correct total
for all the ingredients, eg

- Sticks   £12.50
  Sugar   £ 9.90
  Apples   + £22.50
  Total   £44.99

OR

Award **ONE** mark for sight of £12.50 **and** £9.90

Up to 3

[3]

36 Award **TWO** marks for the correct answer of £12396.

If the answer is incorrect, award **ONE** mark for evidence of an appropriate method, eg:

-    £8264
  ×   4
   £33056

OR

   £33056
−   8264
  £24792

£24792 ÷ 2

OR

- £8264 ÷ 2 = £4132
  £8264 + £4132

  Answer need not be obtained for the award of **ONE** *mark*

Up to 2

[2]

37 A counter-example or an explanation that shows Alfie is incorrect, eg:

■   'It doesn't work when one of the numbers is 1'

       No mark is awarded for circling 'No' alone.

       Do not *accept vague or incomplete explanations, eg:*

       ■ *'It's not always true'*

       ■ *'It doesn't work when* **one** *of the numbers is small'*

■   '1 × 99 = 99, and 99 is not less than 99'

■   'It's not true for zero'

■   '0 × 5 = 0, and 0 is less than 5'

■   'It doesn't work for fractions less than 1'

■   '0.5 × 8 = 4, and 4 is less than 8'

■   'If one number is negative and the other is positive, the answer is negative'

       If 'Yes' is circled but a correct, unambiguous explanation is given then award the mark.

                                                      U1

                                                           [1]

38 An explanation which recognises that they are equally likely to choose a blue counter, eg:

■   'Half the counters in each bag are blue'

■   '5 out of 10 is the same as 10 out of 20'

■   'Chen has twice as many blue counters but he also has twice as many counters altogether, so the chance is the same'.

       No mark is awarded for circling 'No' alone.

       Do not *accept vague or incomplete explanations, eg:*

       ■ *'There is an equal chance'*

       ■ *'If Chen has 10 blue and Megan has 5'.*

       If 'Yes' is circled but a correct, unambiguous explanation is given, then award the mark.

                                                      U1

                                                           [1]