Langdon Park Maths
Foundation Paper 3
Predicted Paper B

Name: _____

Class: _____

Date: _____

Time: **84 minutes**

Marks: **80 marks**

Comments:

Q1.

(a) Circle the smallest number.

2.31 $2.\dot{3}$ 2.33 2.301

(1)

(b) Circle the largest number.

7.1 $7.\dot{1}$ 7.11 7.101

(1)

(Total 2 marks)

Q2.

(a) As a product of prime factors $40 = 2^3 \times 5$

Write 50 as a product of prime factors.

_____

_____

Answer _____

(2)

(b) Work out the Least Common Multiple of 40 and 50

_____

_____

Answer _____

(2)

(Total 4 marks)

Q3.

Some temperatures are shown.

Leeds	−2 °C
Glasgow	−5 °C
Oxford	4 °C

(a) Which place has the lowest temperature?

Answer _____

(1)

(b) Work out the difference between the temperatures in Leeds and Oxford.

_____

Answer _____ °C

(1)

(c) The Glasgow temperature falls by 2 °C.

Work out the new temperature in Glasgow.

_____

Answer _____ °C

(1)

(Total 3 marks)

Q4.

Here is a bank statement.

Date	Description	Credit £	Debit £	Balance £
13 Oct	Starting balance			136.05
14 Oct	Cash paid in	40.00		176.05
15 Oct	Refund	65.20		_____
16 Oct	Go Shop		83.19	_____
17 Oct	Water bill		164.76	_____
18 Oct	Wage	46.00		_____

Complete the balance column.

(Total 3 marks)

Q5.

Solve $x^2 = 30.25$

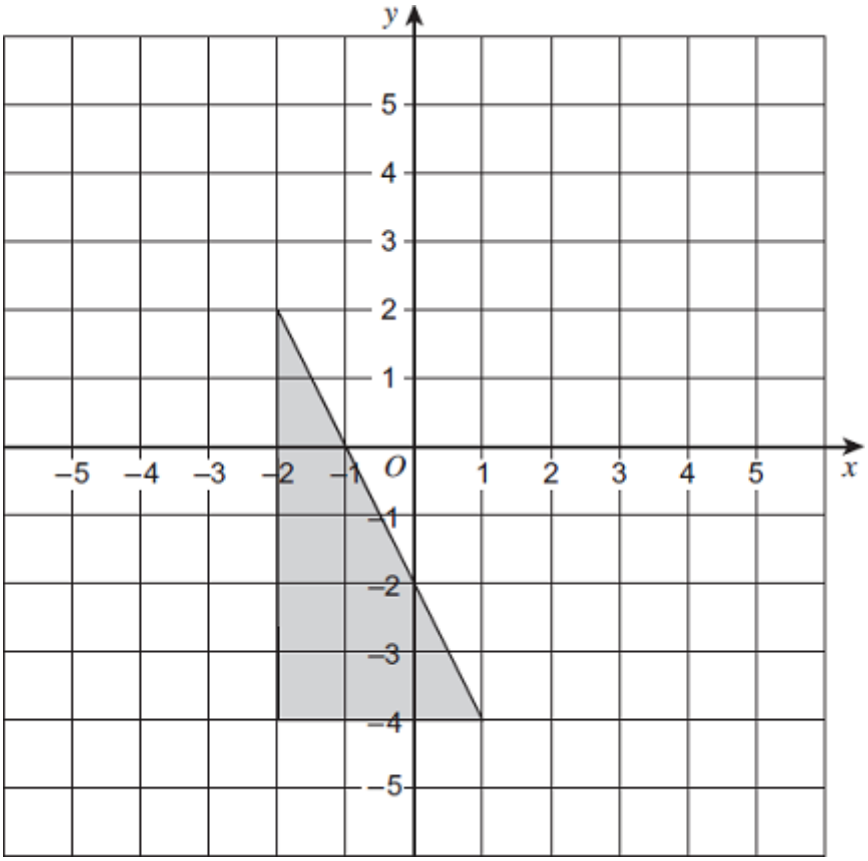
_____

Answer _____

(Total 2 marks)

Q6.

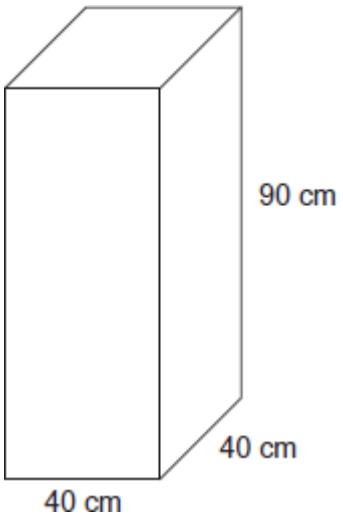
Enlarge the triangle by scale factor $\frac{1}{3}$ with centre (−5, −4).



(Total 2 marks)

Q7.

The diagram shows a water tank in the shape of a cuboid.



The tank is full of water.

1 litre = 1000 cm^3

How many gallons of water are in the tank?

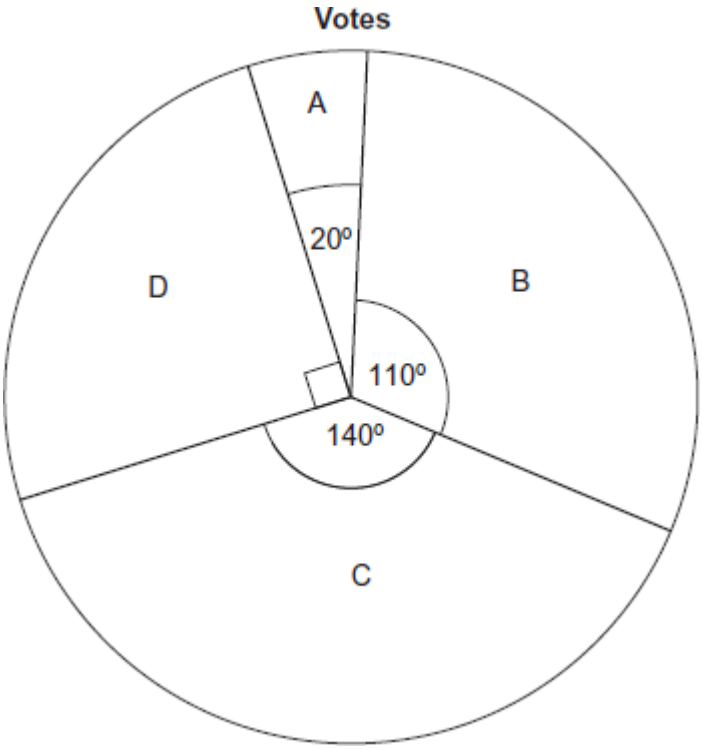
_____

Answer _____ gallons

(Total 4 marks)

Q8.

The pie chart shows information about how people voted in an election.



1800 people voted for D.

How many **more** people voted for C than B?

Answer _____

(Total 3 marks)

Q9.

The table summarises the amounts spent, £A, by customers in a shop in one hour.

Amount spent, £A	Number of customers		
$0 < A \leq 10$	18		
$10 < A \leq 20$	15		
$20 < A \leq 30$	7		
More than 30	0		

(a) Work out an estimate of the mean amount spent per customer in one hour.

Answer £ .....

(4)

(b) Using the till receipts, the manager works out the actual mean amount spent for each group.

Amount spent, £A	Number of customers	Actual mean amount spent
$0 < A \leq 10$	18	£4.50
$10 < A \leq 20$	15	£15.00
$20 < A \leq 30$	7	£23.40

Without further calculation, decide whether the actual mean of the 40 customers will be different from the estimated mean in part **(a)**.

Tick a box.

☐ Higher ☐ Lower ☐ The same

Give a reason for your answer.

_____

_____

_____

_____

(2)

(Total 6 marks)

Q10.

Work out $(5.85 \times 10^6) \div (1.3 \times 10^2)$

Give your answer in standard form.

_____

_____

_____

_____

Answer _____

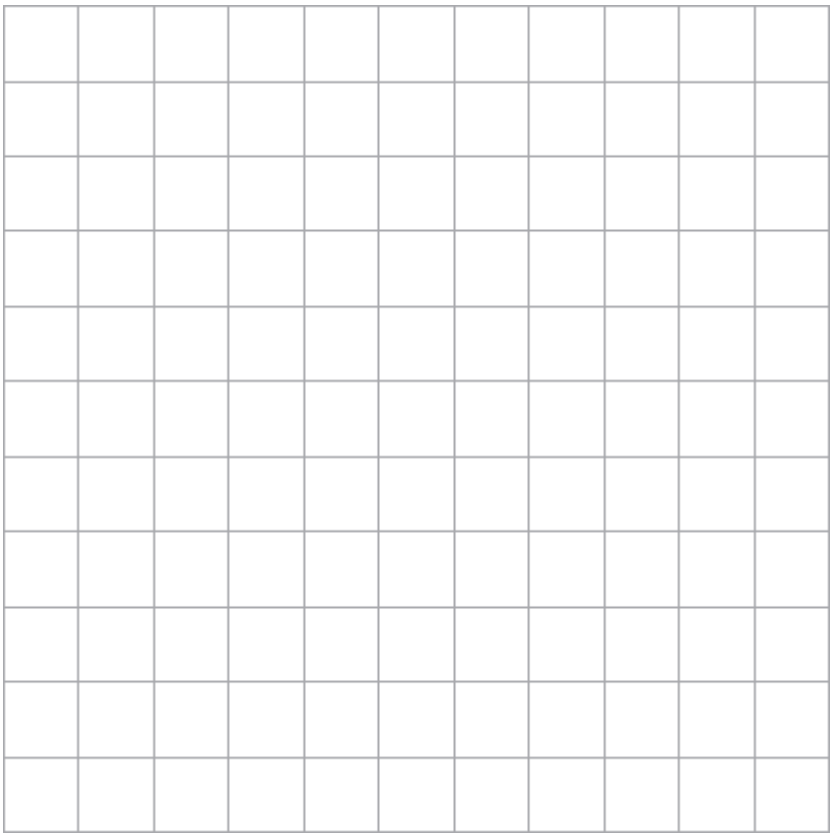
(Total 2 marks)

Q11.

A band played 20 concerts in five continents.

Continent	Tally	Frequency
Africa	|	
Asia	|	
Europe	𝍸 𝍸	
North America	|||	
South America	𝍸	
		Total = 20

(a) Draw a fully labelled bar chart to show this information.



(4)

(b) What fraction of the 20 concerts were in South America?
Give your answer in its simplest form.

_____

Answer _____

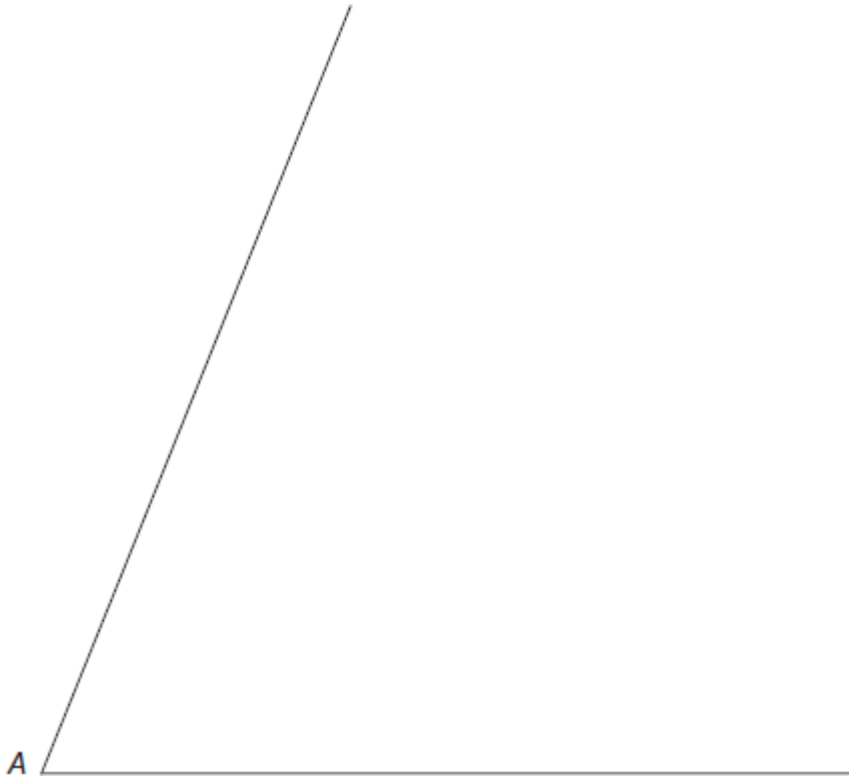
(2)

(Total 6 marks)

Q12.

You will need a ruler and compasses to answer this question.

Construct the angle bisector of angle *A*.

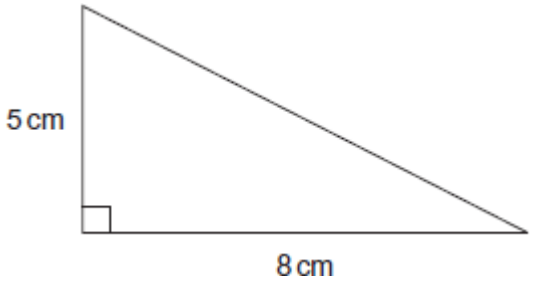


(Total 2 marks)

Q13.

Calculate the area of the triangle.

Not drawn accurately

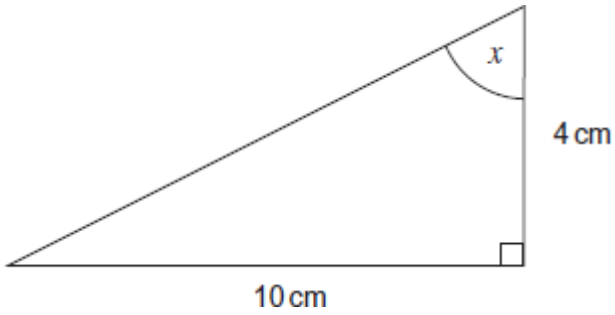


Answer _____ cm^2

(Total 2 marks)

Q14.

Not drawn accurately



Work out the size of angle x.

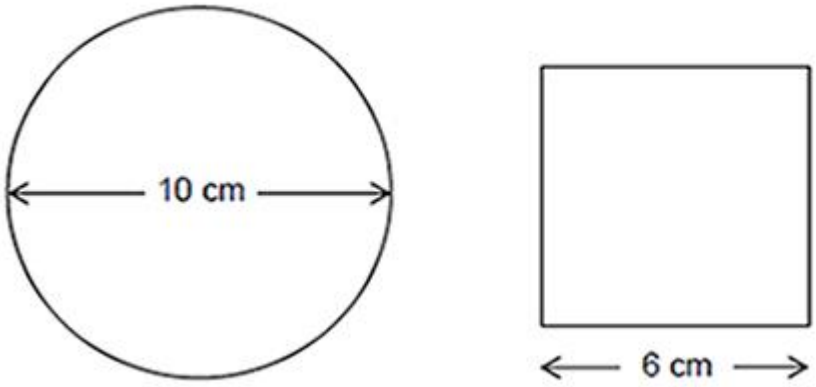
Answer _____ degrees

(Total 3 marks)

Q15.

A circle has diameter 10 cm.
A square has side length 6 cm.

Not drawn accurately



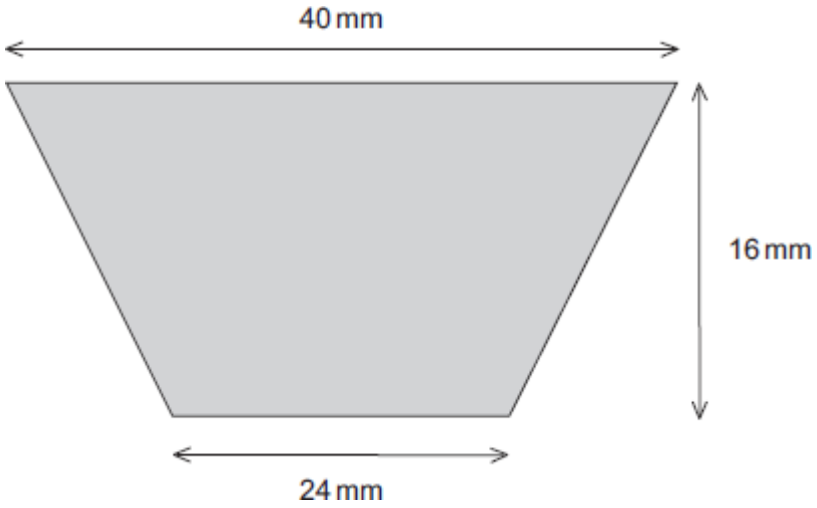
Use Pythagoras' theorem to show that the square will fit inside the circle without touching the edge of the circle.

(Total 3 marks)

Q16.

(a) A jeweller has a piece of silver in the shape of a trapezium.

Not drawn accurately



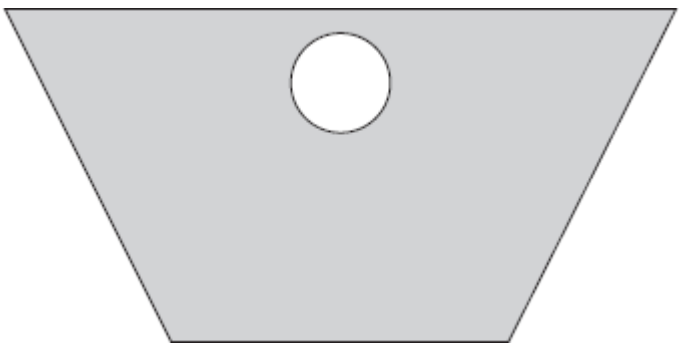
Work out the area of the trapezium.

Answer _____ mm^2

(2)

(b) She cuts out a circle of radius 4 mm from the trapezium to make a pendant.

Not drawn accurately



Work out the area of the circle.

Answer _____ mm^2

(2)

(c) The silver from the circle is waste material.

What percentage of silver does the jeweller waste making the pendant?

Answer _____ %

(2)

(Total 6 marks)

Q17.

(a) Solve $3a = 12$

Answer $a =$ _____

(1)

(b) Solve $\frac{x}{5} = -6$

Answer $x =$ _____

(1)

(c) Solve $5c + 4 = 19$

Answer $c =$ _____

(2)

(d) Factorise fully $4t - 20$

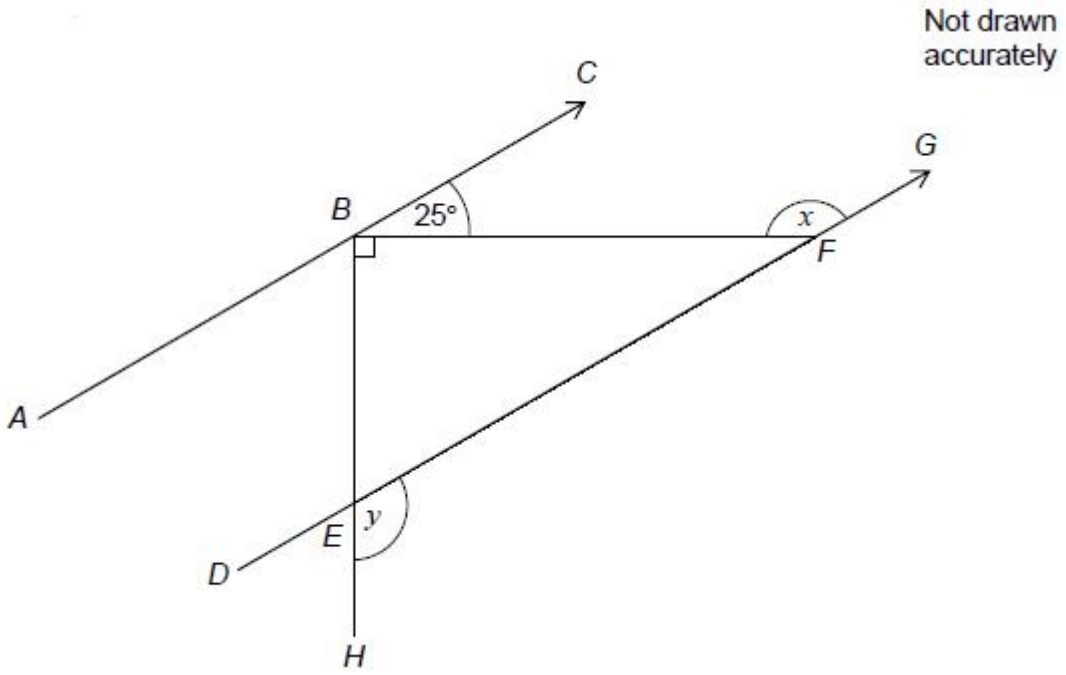
Answer _____

(1)

(Total 5 marks)

Q18.

ABC and *DEFG* are parallel lines.
BEH is a straight line.



(a) Work out the size of angle x.

_____

Answer _____degrees

(1)

(b) Work out the size of angle y.
You **must** show your working, which may be on the diagram.

_____

_____

_____

_____

Answer _____degrees

(2)

(Total 3 marks)

Q19.

Circle the fraction equivalent to 2.375

$\frac{23}{75}$ $\frac{9}{4}$ $\frac{19}{8}$ $\frac{75}{23}$

(Total 1 mark)

Q20.

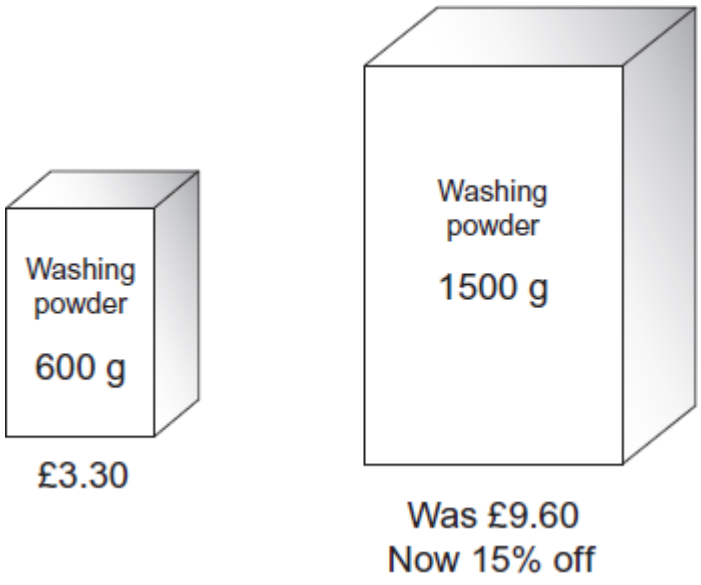
Expand and simplify $3(2x + 5) - 2(x - 4)$

Answer _____

(Total 3 marks)

Q21.

Washing powder is sold in two sizes, 600 grams and 1500 grams.



Which size is better value for money?
You **must** show your working.

Answer _____

(Total 6 marks)

Q22.

Sophie sells birthday cards.

She adds 30% profit to the cost price.
She sells the cards for £2.34 each.
She wants to increase her profit to 40% of the cost price.

How much should she sell each card for?

Answer £ _____

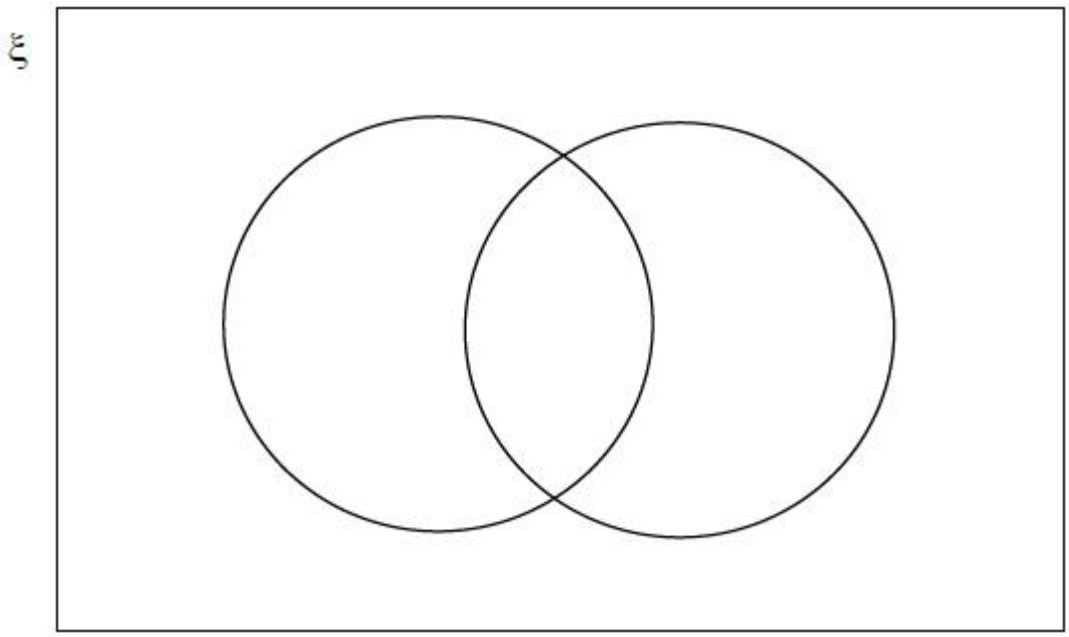
(Total 3 marks)

Q23.

During Year 10 a school runs a trip to Austria and a trip to France.

63 students go to Austria.
89 students go to France.
15 students go to both Austria and France.
54 students do not go on either trip.

How many students are there in Year 10?
You may use the Venn diagram to help you.



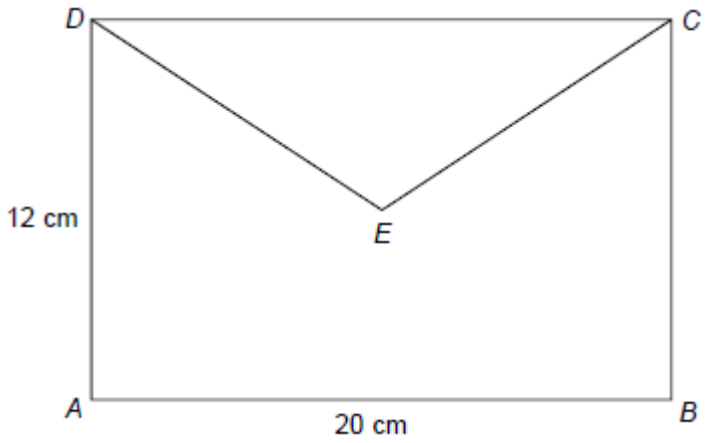
Answer _____

(Total 3 marks)

Q24.

E is the centre of rectangle *ABCD*.

Not drawn accurately



Work out the length *DE*.

Answer _____ cm

(Total 3 marks)

Mark schemes

Q1.

(a) 2.301

B1

(b) 7.1

B1

[2]

Q2.

(a) 2 × 25 or 5 × 10

oe eg 50 ÷ 2 = 25 ***or*** *branches on a prime factor tree* ***or*** *any indication eg (2, 25) of a 'product' that equals 50* ***or*** *2, 5, 5* ***or*** *2, 5 and 5 shown as the last numbers of a prime factor tree (allow 1s)*

M1

2 × 5 × 5

$2^{(1)} \times 5^2$

A1

(b) List of multiples of 40 and 50 to at least 80, 120 and 100, 150

Venn diagram (ft their prime factors for 50 in (a))

M1

$2^3 \times 5^2$ or 200

oe SC1 any multiple of 200

A1

[4]

Q3.

(a) Glasgow

Allow G or –5

B1

(b) 6

B1

(c) –7

B1

[3]

Q4.

241.25
158.06
−6.70
39.30

oe eg £6.70 overdrawn

B2 4 correct values with incorrect money notation

B2ft 3 correct values with correct money notation

B1ft 3 correct values with incorrect money notation

or

2 correct values with correct money notation

ft their values

SC2 39.30 in final cell with rest blank

SC1 39.3 in final cell with rest blank

SC1 110.85, 194.04, 358.80, 312.80

B3

Additional Guidance

Follow through their 241.25 − 83.19, their 158.06 − 164.76 and their −6.7(0) + 46 correctly evaluated

Ignore any units given and any extra values in credit/ debit column

241.25, 158.06. −6.7, 39.30 (four correct but some incorrect notation)

B2

110.85, 27.66, −137.10, −91.10 (last three correct ft and all correct notation)

B2ft

110.85, 27.66, −137.1, −91.10 (last three correct ft but incorrect notation)

B1ft

110.85, 194.04, 29.28, 75.28 (last two correct ft and correct notation)

B1ft

[3]

Q5.

5.5 and −5.5

oe

B1 for each

B2

Additional Guidance

± 5.5

B2

[2]

Q6.

Fully correct enlargement with vertices at (−3, −4), (−4, −2) and (−4, −4)

B1 for any enlargement SF $\frac{1}{3}$

B1 for 2 correct vertices

B2

[2]

Q7.

1 gallon = 4.5 litres stated or implied

e.g. their 144 ÷ 4.5

B1

40 × 40 × 90 or 144 000

M1

their 144 000 ÷ 1000 or 144

M1dep

32

A1

Additional Guidance
Note: use of 1 litre = 1.75 pints implies answer 31.5

B1M1M1A1

[4]

Q8.

140 − 110

90 ÷ 3

or 30

or 1800 is 90°

or 1800 × 4

or 7200 seen

or 1800 ÷ 90

or 7200 ÷ 360

or 20

oe
90 ÷ 1800 or 0.05°
1800 may be in sector D but must see 90

M1

1800 ÷ 90 × 140 or 2800

or 1800 ÷ 90 × 110 or 2200

or 1800 ÷ 90 × 20 or 400

or 1800 ÷ 90 × 30

or 1800 ÷ 3

oe
140 ÷ 0.05 or 2800
or 110 ÷ 0.05 or 2200
or 20 ÷ 0.05 or 400
or 30 ÷ 0.05

M1dep

600

SC1 for 150

A1

Additional Guidance
1800 is ¼, 7200 is the whole circle

M1

1800 is ¼

M0

[3]

Q9.

(a) Mid values seen

5, 15, 25

or 5.005, 15.005, 25.005

or 5.01, 15.01, 25.01

B1

5 × 18 (+) 15 × 15 (+) 25 × 7

Accept use of mid values 5.005, 15.005, 25.005 or 5.01, 15.01, 25.01

Allow one error

eg one mid value incorrect or one calculation incorrect

M1

their 490 ÷ 40

M1dep

12.25 or 12.26

SC2 for 7.25 or 7.26

or 17.25 or 17.26

A1

(b) Indicates lower

B1

Valid reason

eg (£)4.50 is less than (£)5 and (£)23.40 is less than (£)25

B1

[6]

Q10.

5 850 000 or 130 or 45 000
or 4.5 or 10^4

M1

4.5×10^4

A1

[2]

Q11.

(a) At least four correct frequencies

May be seen in frequency table or implied by bars

M1

Five bars drawn to 1, 1, 10, 3, 5 in any order, but matching the continent labels if given

A1

Frequency axis correctly scaled, starting at 0, with at least two numbers given

Ignore scaling beyond their tallest bar

Must be using a scale of at least 0.5 cm per unit

B1

Correct structure − equal width bars, gaps **and** labels

Strand (ii) Logical organised working

Must have gaps of equal width between bars
Labels may be eg frequency or (number of) concerts
and continent names (may be on bars)

Q1

Additional Guidance

Evidence for the M mark could be found in or around the table, or from the bar heights

Condone bars of different widths for all but the Q mark

If no vertical scale is shown, assume 1 square = 1 concert or ½ square = 1 concert

Vertical line graph can score all but the Q mark

Horizontal or vertical bar chart can score full marks

Allow vertical label to be 'Concerts' or 'Numbers' but not 'Tally'

(b) $\frac{5}{20}$

oe
Accept '5 out of 20' or '1 in 4' for this mark

M1

$\frac{1}{4}$

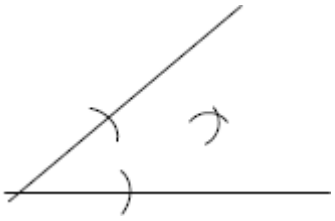
SC1 for fully simplifying any fraction

A1

[6]

Q12.

Arc(s) centred on A of lengths within 1 cm of each other crossing both lines, and intersecting arcs centred on the intersection points



M1

Angle bisector from A within tolerance

Must score the M to get the A

A1

Additional Guidance
Must see arcs on rays, ie no dots as can be measured with a ruler
Note that using bottom ray as length of arc will have just one arc about 2mm from end of oblique ray. This is same as 'two arcs'.

[2]

Q13.

$\frac{1}{2} \times 5 \times 8$

oe

M1

20

A1

[2]

Q14.

tan chosen

$100 = 116 + 16 - 2 \times \sqrt{116} \times 4 \cos x$

$\frac{\sin x}{10} = \frac{\sin 90}{\sqrt{116}}$

oe

M1

$\tan x = \frac{10}{4}$

$\tan x = 2.5$

oe

If hypotenuse used

$\sin x = \frac{10}{\sqrt{116}}$

or $\cos x = \frac{4}{\sqrt{116}}$ *or* $\cos x = \frac{116 + 16 - 100}{2 \times \sqrt{116} \times 4}$

$\sin x = 0.928\ldots$ *or* 0.93

or $\cos x = 0.37\ldots$

M1dep

[68, 68.2]

A1

[3]

Q15.

Alternative method 1

$6^2 + 6^2$
or 36 + 36
or 72

M1

$\sqrt{6^2 + 6^2}$ or $\sqrt{72}$

oe

M1dep

$\sqrt{72} < 10$

oe

eg $\sqrt{72}$ *is between 8 and 9*

A1

Alternative method 2

$3^2 + 3^2$
or 9 + 9
or 18

M1

$\sqrt{3^2 + 3^2}$ or $\sqrt{18}$

oe

M1dep

$\sqrt{18} < 5$

oe

eg $\sqrt{18}$ *is between 4 and 5*

A1

[3]

Q16.

(a) $\frac{1}{2} \times (40 + 24) \times 16$

oe

M1

512

A1

(b) $\pi \times 4 \times 4$

oe

M1

[50.2, 50.3] **or** 16π

A1

(c) $\frac{\text{their [50.2,50.3]}}{\text{their 512}}$

(= [0.098, 0.0982422])

M1

[9.8, 9.82422]

ft their 512 and their [50.2, 50.3]
Allow 10 with correct method seen
SC1 [90.18, 90.2]

A1ft

[6]

Q17.

(a) 4

B1

(b) −30

B1

(c) $5c = 19 - 4$ or 15

M1

3

A1

(d) $4(t - 5)$

Accept $4 \times (t - 5)$

B1

[5]

Q18.

(a) 155

B1

(b) $y = 90 + 25$
or
$BEG = 180 - 90 - 25$ or $BEG = 65$
or
$ABE = 180 - 90 - 25$ or $ABE = 65$
and
$DEB = 180 -$ their 65 or $DEB = 115$

oe

M1

115

A1

[3]

Q19.

$\frac{19}{8}$

B1

[1]

Q20.

$6x + 15 - 2x + 8$

allow one error

M1

$6x + 15 - 2x + 8$

fully correct

A1

$4x + 23$

do not ignore fw

SC2 $4x + 7$

A1ft

Additional Guidance

Do not allow fw eg. $4x + 23 = 27x$ score A0 for final accuracy mark

Allow fw in trying to solve equation after $4x + 23$ seen to score A1 for final accuracy mark

$6x + 15 - 2x - 8$

$4x + 7$ is M1 A0 A1ft

$4x + 7$ alone on answer line is SC2

Two independent expanded brackets (shown one underneath the other)

$6x + 15$

$2x - 8$

with $4x + 23$ on answer line is M1 A1 A1

Two independent expanded brackets shown remotely (same line)

$6x + 15$ $2x - 8$

with $4x + 23$ on answer line is M1 A1 A1

Two independent expanded brackets shown remotely without correct answer on answer lines scores zero marks

$6x + 15$ $2x - 8$

with answer line blank is M0 A0 A0

[3]

Q21.

Alternative method 1

$\frac{1500}{600}$ or 2.5

or $\frac{600}{1500}$ or 0.4

oe

M1

3.3 × 2.5 or 8.25

9.6 ÷ 2.5 or 3.84

$\frac{15}{100} \times 9.6$ *or 1.44*

or 0.85 seen

M1

$\frac{15}{100} \times 9.6$ or 1.44

or 0.85 seen

$\frac{15}{100} \times 3.84$

or 0.576
or 0.85 seen
9.6 − their 1.44
or 0.85 × 9.6
or 8.16

M1

9.6 − their 1.44 or 8.16

or 0.0064 × 0.85

3.84 − 0.576
or 0.85 × 3.84
their 8.16 ÷ 2.5

M1dep

8.25 and 8.16

3.26 or 3.264 or 3.27

A1

1500 g pack identified

Strand(iii) correct conclusion for their values provided method marks have been awarded

Q1ft

Alternative method 2

3.3 ÷ 600 or 0.0055 (price per 1g)

3.3 ÷ 6 or 0.55 (price per 100g)

M1

9.6 ÷ 1500 or 0.0064

9.6 ÷ 15 or 0.64

$9.6 \times \frac{15}{100}$ *or 1.44*

or 0.85 seen

M1

$\frac{15}{100} \times 0.0064$ or 0.00096

or 0.85 seen

$\frac{15}{100} \times 0.64$ *or 0.096*

or 0.85 seen
9.6 − 1.44
or 0.85 × 1.44
or 8.16

M1dep

their 0.0064 − their 0.00096

or 0.85 × 0.0064

or 0.0054(4)

their 0.64 − their 0.096
or 0.85 × their 0.64

or 0.544

8.16 ÷ 15 or 0.544

M1dep

0.0055 and 0.00544

0.55 and 0.544

A1

1500 g pack identified

Strand(iii) correct conclusion for their values provided method marks have been awarded

Q1ft

Alternative method 3

3.3 ÷ 600 or 0.0055 (price per 1 g)

M1

$\frac{15}{100} \times 9.6$ or 1.44

or 0.85 seen

9.6 ÷ 2.5 or 3.84

$\frac{15}{100} \times 9.6$ *or 1.44*

or 0.85 seen

M1

9.6 − their 1.44

or 0.85 × 9.6

or 8.16

$\frac{15}{100} \times 3.84$

or 0.85 seen

or 0.576

9.6 − their 1.44

or 0.85 × 9.6

or 8.16

M1

their 8.16 ÷ 1500 or 0.00544

3.84 − 0.576

or 0.85 × 3.84

their 8.16 ÷ 2.5

M1dep

0.0055 and 0.00544

3.26 or 3.27

A1

1500 g pack identified

Strand(iii) correct conclusion for their values provided method marks have been awarded

Q1ft

Alternative method 4

600 ÷ 3.3 or 181.8…

3.30 × 5 or 16.50

M1

$\frac{15}{100} \times 9.6$ or 1.44

or 0.85 seen

$\frac{15}{100} \times 9.6$ or 1.44

or 0.85 seen

M1

9.6 − their 1.44

or 0.85 × 9.6

or 8.16

9.6 − their 1.44

or 0.85 × 9.6

or 8.16

M1

1500 ÷ their 8.16 or 183.8…

their 8.16 × 2 or 16.32

M1

181.8… and 183.8 …

16.32 and 1650

A1

1500 g pack identified

Strand(iii) correct conclusion for their values provided method marks have been awarded

Q1ft

[6]

Q22.

130% = £2.34
or 2.34 × 1.3
or (£)1.8(0)

oe

M1

their (£)1.8(0) × 1.4

M1dep

2.52

A1

[3]

Q23.

Alternative method 1

63 − 15 or 48
or

89 − 15 or 74

May be seen in Austria only section of the Venn diagram

May be seen in France only section of the Venn diagram

M1

(63 − 15) (+) (89 − 15) (+) 15 (+) 54
or 48 (+) 74 (+) 15 (+) 54

Fully correct Venn diagram

M1

191

A1

Alternative method 2

63 + 89 − 15 or 137

M1

their 137 + 54

63 + 89 − 15 + 54 gets M2

M1

191

A1

[3]

Q24.

Alternative method 1

6 and 10 seen

M1

(their 6)² + (their 10)² or 136

M1dep

[11.66, 11.7] or $\sqrt{136}$ or $2\sqrt{34}$

A1

Alternative method 2

$12^2 + 20^2$ or 544

M1

$\sqrt{\text{their } 544}$ or $4\sqrt{34}$

or [23.32, 23.324]

M1dep

[11.66, 11.7] or $\frac{\sqrt{544}}{2}$ or $\sqrt{136}$

or $2\sqrt{34}$

A1

[3]