

AQA Foundation Paper 3 Practice Questions

Q1.

(a) Simplify $3f \times 5g$

$$15fg$$

(1)

(b) Simplify $t \times t$

$$t^2$$

(1)

(c) Simplify $\frac{2n + 6n}{2}$

$$\frac{8n}{2} = 4n$$

$$4n$$

(1)

(Total for question = 3 marks)

Q2.

(a) Simplify $5p - 3p + p$

$$3p$$

(1)

(b) Simplify $m^3 + m^3$

$$2m^3$$

(1)

(c) Simplify $10 + 3c + 5d - 7c + d$

$$10 - 4c + 6d$$

(2)

(Total for question = 4 marks)

Q3.

Batteries are sold in packets and in boxes.

There are 4 batteries in a packet.

There are 20 batteries in a box.

Derek buys one box of batteries.

He takes t batteries out of the box.

(a) Write down an expression, in terms of t , for the number of batteries left in the box.

$$20 - t$$

(1)

Sameena buys x packets of batteries and y boxes of batteries.

(b) Write down an expression, in terms of x and y , for the total number of batteries Sameena buys.

$$4x + 20y$$

(2)

(Total for question = 3 marks)

Q4.

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

	$5x$	2
$2x$	$10x^2$	$4x$
-3	$-15x$	-6

$$10x^2 - 11x - 6$$

(2)

(b) Factorise $x^2 + 4x + 3$

	x	1
x	x^2	x
3	$3x$	3

$$(x + 1)(x + 3)$$

(2)

(Total for question = 4 marks)

Q5.

(a) Factorise $3x + 6$

$$3(x + 2)$$

(1)

(b) Expand and simplify $5(y - 2) + 2(y - 3)$

$$5y - 10 + 2y - 6$$

$$7y - 16$$

(2)

(Total for Question is 3 marks)

Q6.

(a) Factorise $5 - 10m$

$$5(1 - 2m)$$

(1)

(b) Factorise fully $2a^2b + 6ab^2$

$$2ab(a + 3b)$$

(2)

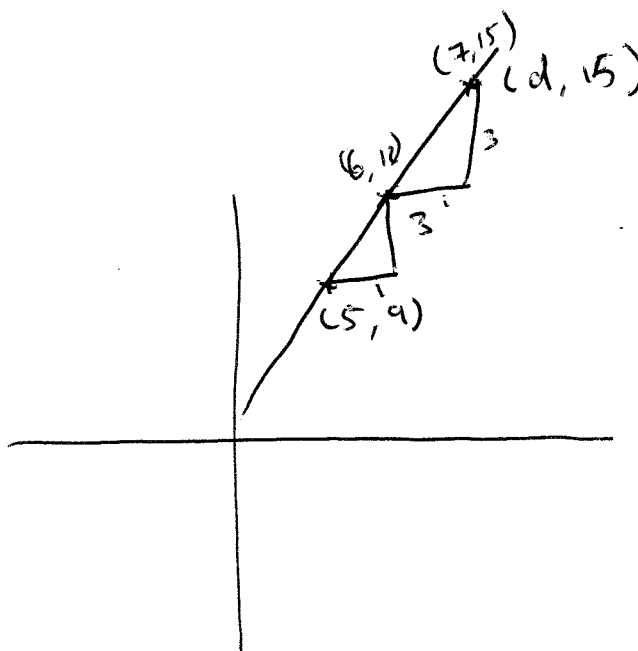
(Total for question = 3 marks)

Q7.

A is the point with coordinates (5, 9)
B is the point with coordinates (d, 15)

The gradient of the line AB is 3

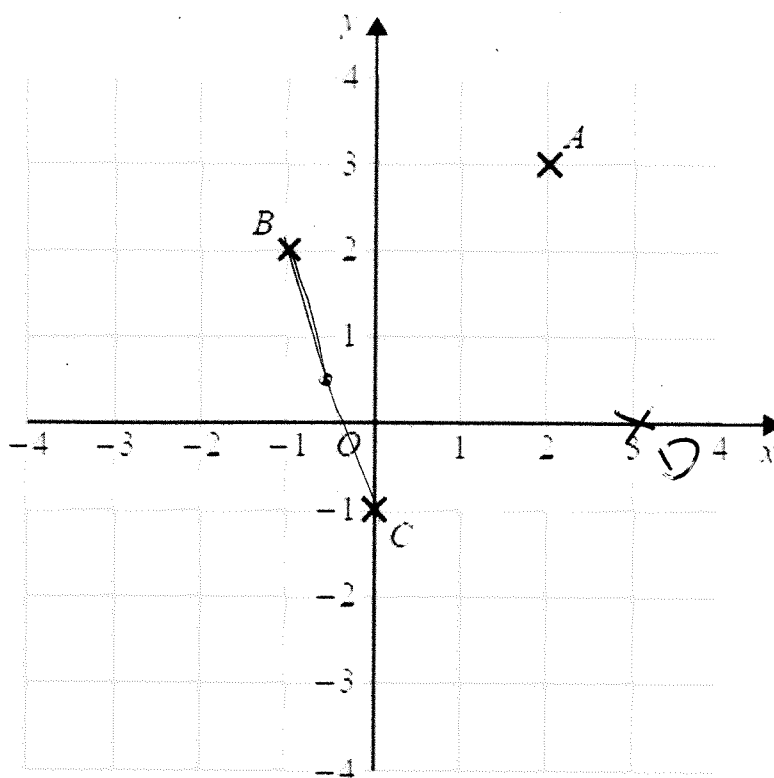
Work out the value of d .



7

(Total for question = 3 marks)

Q8.



(a) Write down the coordinates of point C.

(0, -1)

$ABCD$ is a square.

(b) On the grid, mark with a cross (X) the point D so that $ABCD$ is a square.

(1)

(c) Write down the coordinates of the midpoint of the line segment BC .

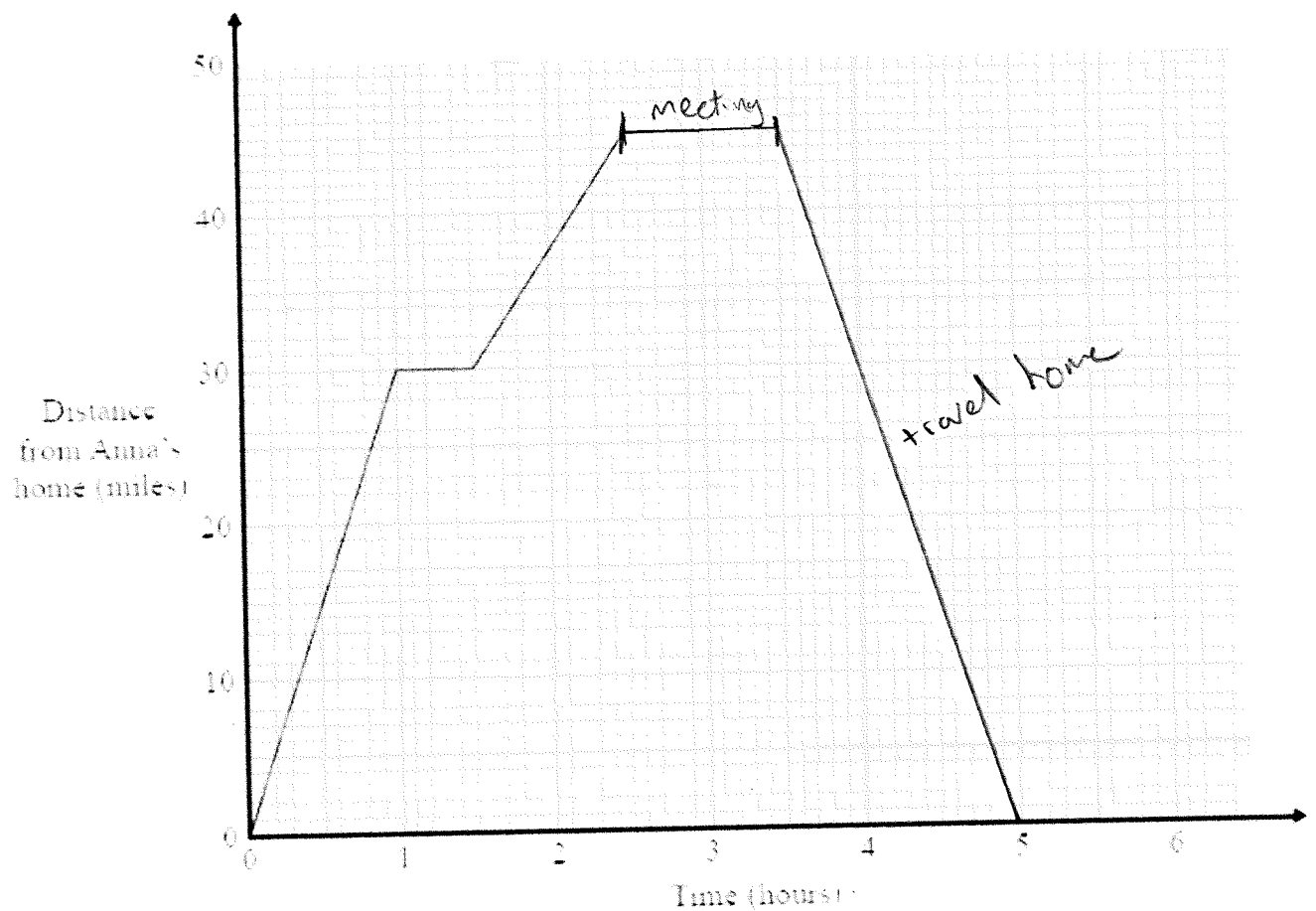
(-0.5, 0.5)

(Total for question is 3 marks)

Q9.

Anna drives 45 miles from her home to a meeting.

Here is the travel graph for Anna's journey to the meeting.



Anna's meeting lasts for 1 hour.

She then drives home at a steady speed of 30 miles per hour with no stops.

Complete the travel graph to show this information.

$$\frac{45}{30} = 1.5 \text{ hrs}$$

(Total for Question is 2 marks)

Q10.

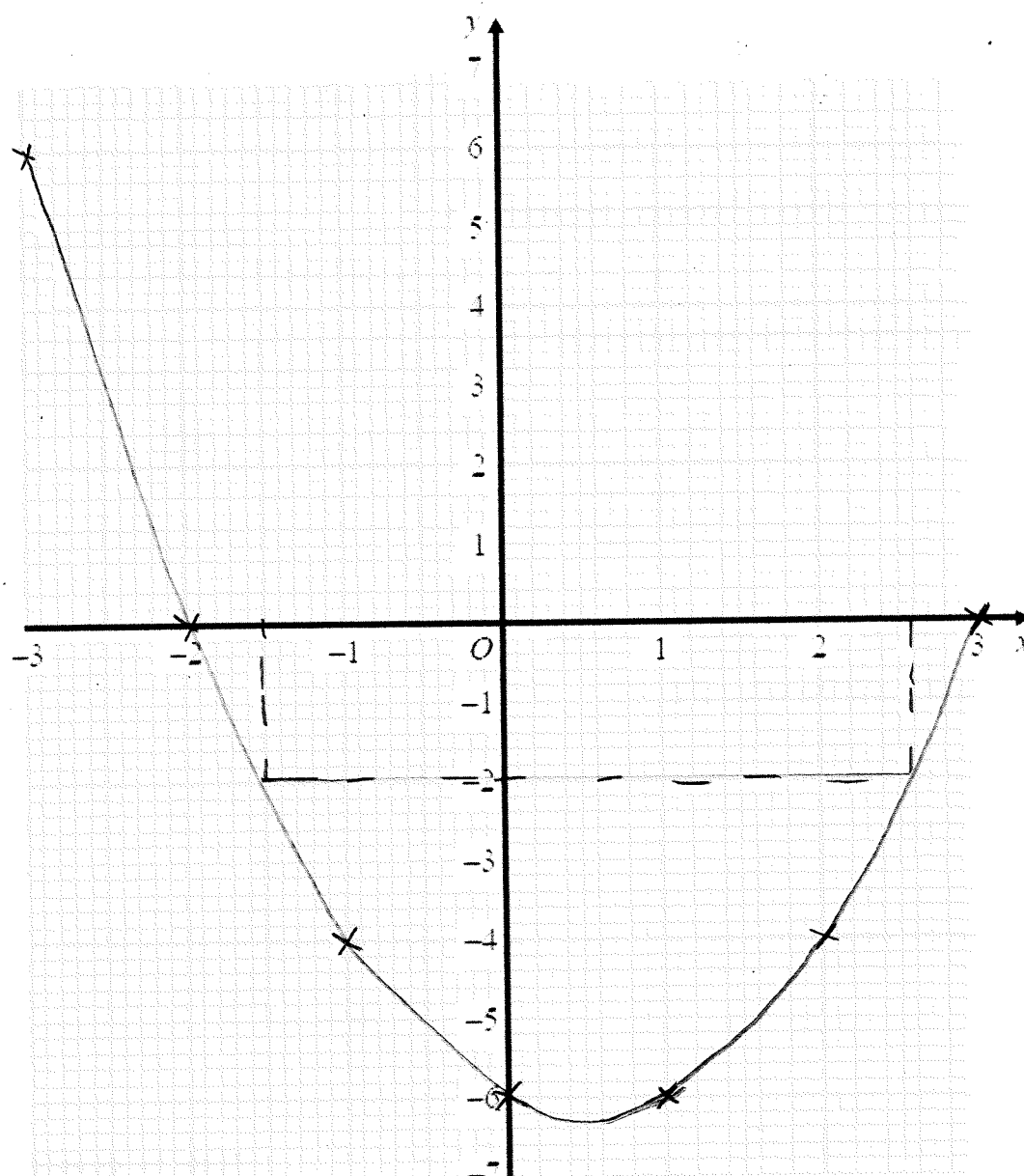
(a) Complete the table of values for $y = x^2 - x - 6$

x	-3	-2	-1	0	1	2	3
y	6	0	-4	-6	-6	-4	0

(2)

(b) On the grid, draw the graph of $y = x^2 - x - 6$ for values of x from -3 to 3

(2)



(c) Use your graph to find estimates of the solutions to the equation $x^2 - x - 6 = -2$

-1.5, 2.6

(2)

(Total for question = 6 marks)

Q11.

Here are the first six terms of a Fibonacci sequence.

1 1 2 3 5 8 13 21 34

The rule to continue a Fibonacci sequence is,

the next term in the sequence is the sum of the two previous terms.

(a) Find the 9th term of this sequence.

34

(1)

The first three terms of a different Fibonacci sequence are

a b $a + b$ $a + 2b$ $2a + 3b$

(b) Show that the 6th term of this sequence is $3a + 5b$

$3a + 5b$

(2)

Given that the 3rd term is 7 and the 6th term is 29,

(c) find the value of a and the value of b .

$$\begin{aligned} a + b &= 7 \\ \times 3 \quad 3a + 5b &= 29 \\ \hline 3a + 3b &= 21 \\ \hline 2b &= 8 \\ b &= 4 \end{aligned}$$

$$\begin{aligned} a + 4 &= 7 \\ a &= 3 \end{aligned}$$

$$a = 3$$

$$b = 4$$

(3)

(Total for question = 6 marks)

Q12.

Robert and his family are going on holiday to France.

A bank gives Robert this chart to help him to change between pounds (£) and euros (€).

pounds (£)	euros (€)
1	1.2
2	2.4
5	6.0
10	12.0
20	24.0
50	60.0
100	120.0

Robert changes £600 into euros (€).

(a) How many euros should Robert get?

$$120 \times 6 = 720$$

(2)

In France, a laptop costs €540

In England, the same laptop costs £460

(b) Work out the difference between the cost of the laptop in France and the cost of the laptop in England.
You must show clearly how you got your answer.

$$460 \times 1.2 = €552$$

$$\text{Cost in England} = €552$$

$$552 - 540 = €12 \text{ euros difference}$$

(3)

(Total for Question is 5 marks)

Q13.

A cooker costs £650 plus 20% VAT.

(a) Calculate the total cost of the cooker.

$$650 \times 1.2 =$$

£ 780
(2)

A washing machine has a price of £260
In a sale its price is reduced by £39

(b) Write the reduction as a percentage of the price.

$$\frac{39}{260} \times 100$$

..... 15 %
(2)

3 kitchen chairs cost a total of £44.79

(c) Work out the total cost of 8 of these chairs.

$$\begin{aligned} 1 \text{ chair} &= 14.93 \\ 8 \text{ chairs} &= 8 \times 14.93 \end{aligned}$$

£ 119.44
(2)

(Total for Question is 7 marks)

Q14.

Lethna worked out $\frac{2}{5} + \frac{1}{2}$

She wrote:

$$\frac{2}{5} + \frac{1}{2} = \frac{2}{10} + \frac{1}{10} = \frac{3}{10}$$

The answer of $\frac{3}{10}$ is wrong.

(a) Describe one mistake that Lethna made.

She didn't change the numerators when she changed the denominators, it should be $\frac{4}{10} + \frac{5}{10}$ (1)

Dave worked out $1\frac{1}{2} \times 5\frac{1}{3}$

He wrote:

$$1 \times 5 = 5 \quad \text{and} \quad \frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$$

$$\text{so } 1\frac{1}{2} \times 5\frac{1}{3} = 5\frac{1}{6}$$

The answer of $5\frac{1}{6}$ is wrong.

(b) Describe one mistake that Dave made.

He also needs to multiply $5 \times \frac{1}{2}$ and $1 \times \frac{1}{3}$ and add those on. (1)

(Total for question is 2 marks)

Q15.

Franz invests £2500 for 2 years at $3\frac{1}{2}\%$ per annum compound interest.

Work out the value of his investment at the end of 2 years.

$$2500 \times 1.035^2$$

£ 2678.06

(Total for question = 3 marks)

Q16.

Harry invests £5000 for 3 years.
He gets simple interest of 4% per year.

Work out the total interest Harry gets.

$$4\% \text{ of } £5000 = £200$$

$$3 \times 200 = £600$$

£ 600

(Total for question = 3 marks)

Q17.

Here are four numbers.

43%

0.43

$\frac{3}{7}$

43.8%

$\frac{7}{16}$

Write these numbers in order of size.
Start with the smallest number.

$$3 \div 7 = 0.42857... = 42.857\%$$

$$7 \div 16 = 0.4375 = 43.75\%$$

$$\frac{3}{7}, 0.43, \frac{7}{16}, 43.8\%$$

(Total for question = 2 marks)

Q18.

Jenny is asked to find the value of $12 - 2 \times 4$

Here is her working.

$$12 - 2 \times 4 = 10 \times 4 = 40$$

Jenny's answer is wrong.

(a) Explain what Jenny has done wrong.

She did $12 - 2$ before she did 2×4
She should have done $12 - 2 \times 4 = 12 - 8$

(1)

Rehan is asked to find the range of the numbers 3, 1, 8, 7, 5

Here is his working.

$$\text{Range} = 5 - 3 = 2$$

This is wrong.

(b) Explain why.

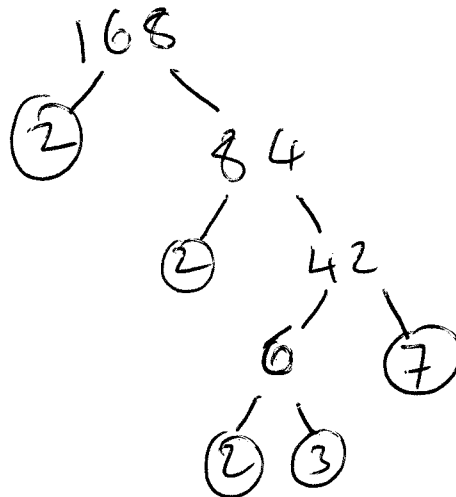
He hasn't used the biggest and
smallest values, it should be $8 - 1$

(1)

(Total for question = 2 marks)

Q19.

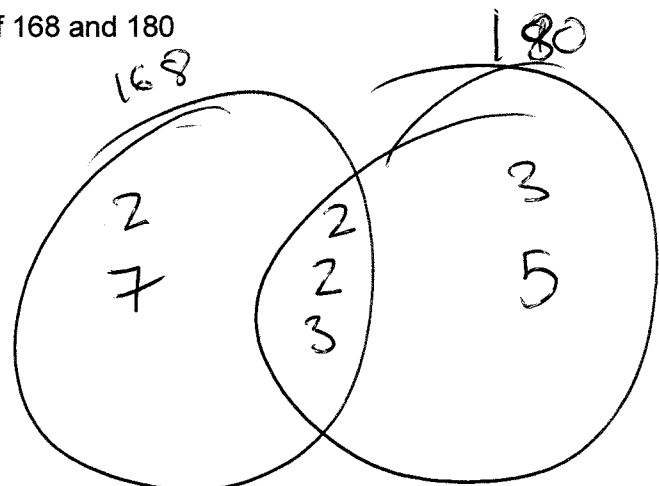
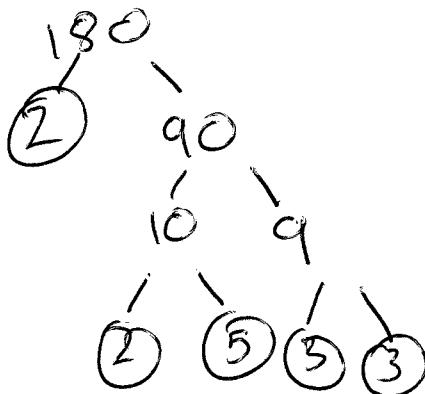
- (a) Write 168 as a product of its prime factors.
You must show your working.



$$2 \times 2 \times 2 \times 3 \times 7$$

(3)

- (b) Find the highest common factor (HCF) of 168 and 180



$$HCF = 2 \times 2 \times 3 = 12$$

(2)

(Total for question = 5 marks)

Q20.

Emily buys a pack of 12 bottles of water.
The pack costs £5.64

Emily sells all 12 bottles for 50p each. $= 12 \times 0.5 = £6$

Work out Emily's percentage profit.
Give your answer correct to 1 decimal place.

$$\text{profit} = 6 - 5.64 = 0.36$$

$$\frac{0.36}{5.64} \times 100 = 6.382978723$$

$$= \underline{6.4} \%$$

(Total for question = 3 marks)

Q21.

Anil wants to invest £25000 for 3 years in a bank.

Personal Bank

Compound Interest

2% for each year

Secure Bank

Compound Interest

4.5% for the first year
0.9% for each extra year

Which bank will give Anil the most interest at the end of 3 years?
You must show all your working.

$$25000 \times 1.02^3$$
$$= £26530.20$$

$$25000 \times 1.045 \times 1.009^2$$
$$= £26546.46$$

Secure bank.

(Total for question = 3 marks)

Q22.

(a) Write 7357 correct to 3 significant figures.

7360

(1)

(b) Work out $\frac{\sqrt{17+4^2}}{7.3^2}$

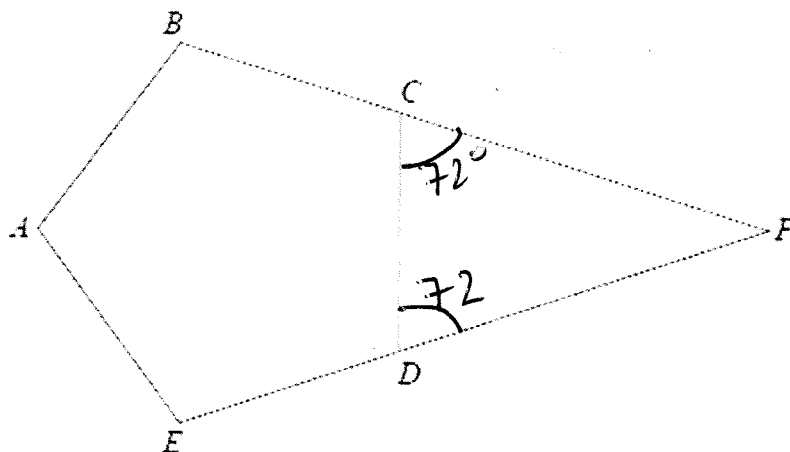
Write down all the figures on your calculator display.

0.1077981356

(2)

(Total for question = 3 marks)

Q23.



$ABCDE$ is a regular pentagon.
 BCF and EDF are straight lines.

Work out the size of angle CFD .
You must show how you get your answer.

$$\angle CDF = 360 \div 5 = 72^\circ \text{ as it is the exterior angle and they sum to } 360^\circ$$

$$\angle DCF = 72^\circ \text{ as well for the same reason.}$$

$$\angle CFD = 180 - 72 - 72 = 36^\circ$$

(Total for question = 3 marks)

Q24.

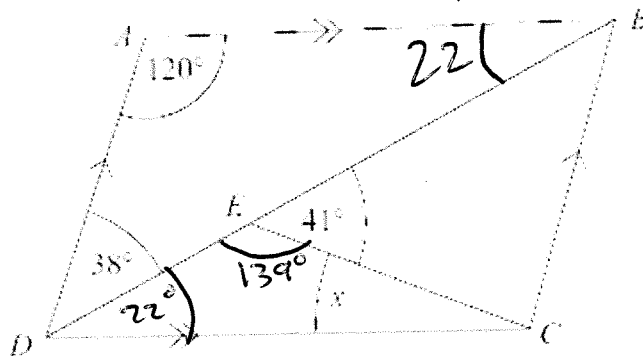


Diagram NOT
accurately drawn

ABCD is a parallelogram.

Angle $ADB = 38^\circ$.
Angle $BEC = 41^\circ$.
Angle $DAB = 120^\circ$.

Calculate the size of angle x .
You must give reasons for your answer.

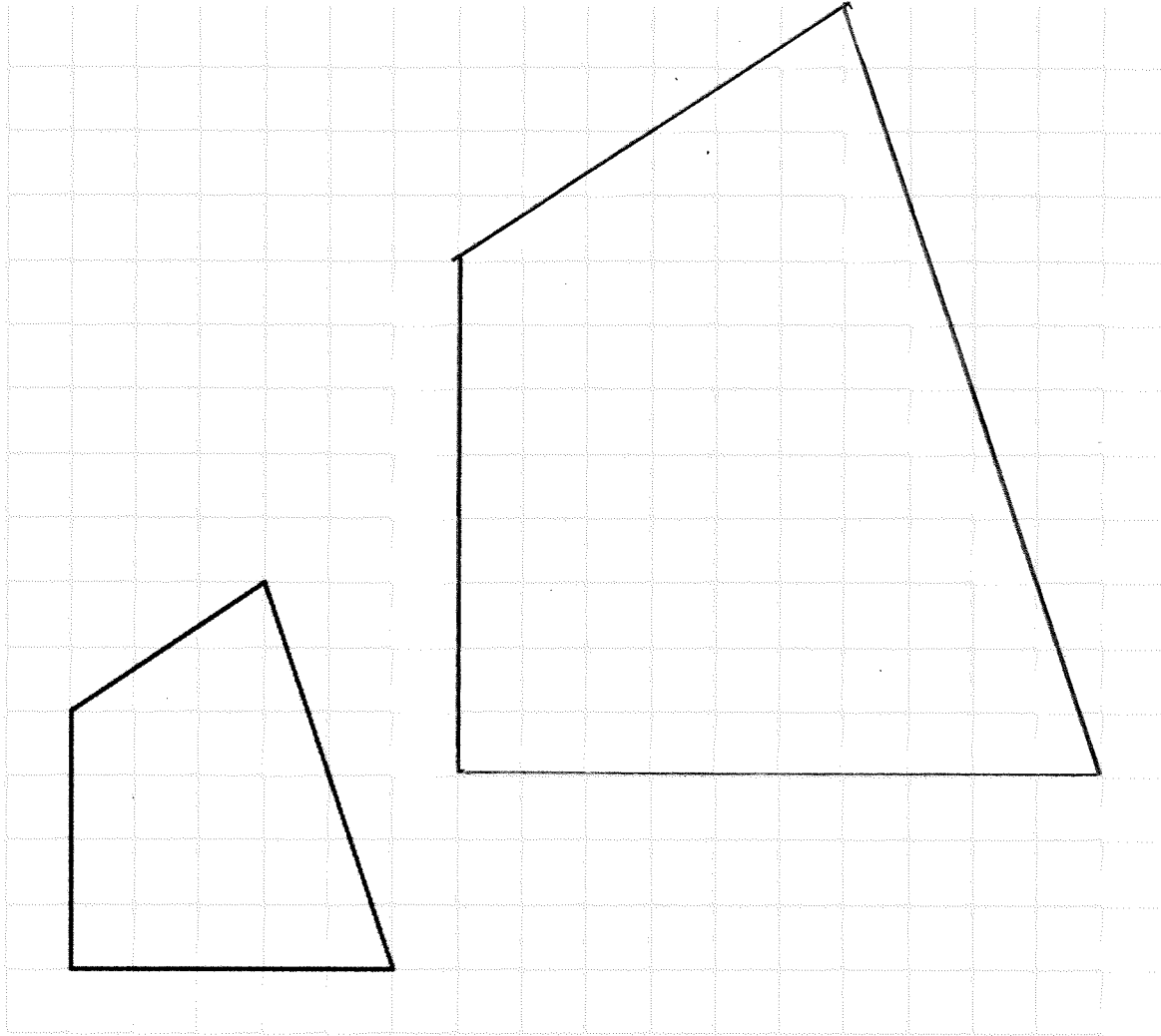
Angle $ABD = 22^\circ$ because angles in a triangle sum to 180°
Angle $\cancel{ABD} EDC = 22^\circ$ because it is alternate to ABD and alternate angles are equal

Angle $DEC = 139^\circ$ because angles on a straight line at a point sum to 180°

$x = 19^\circ$ because angles in triangle sum to 180°

(Total for Question is 4 marks)

Q25.

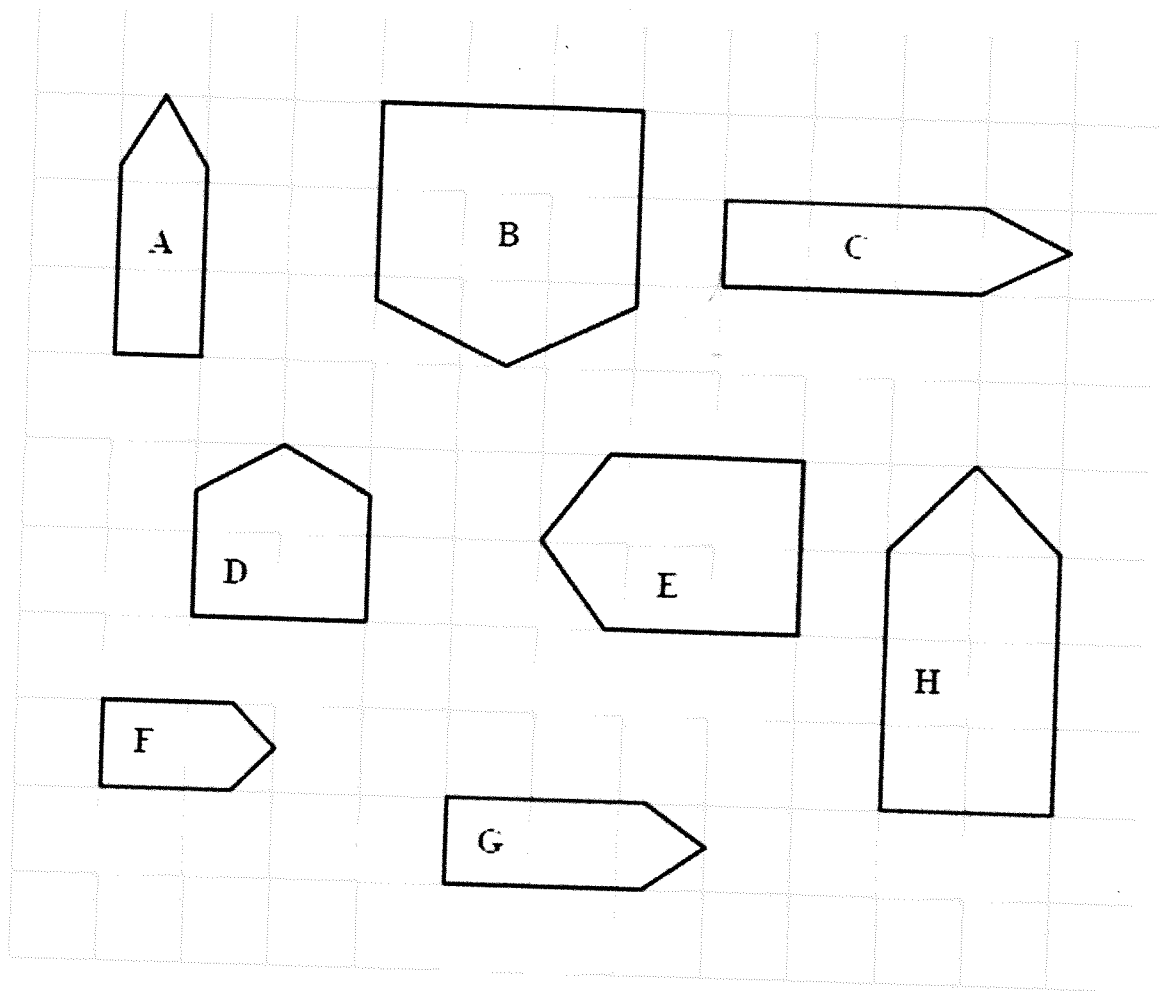


On the grid, draw an enlargement of the shape with a scale factor of 2

(Total for question = 2 marks)

Q26.

Here are eight shapes drawn on a grid of centimetre squares.



Two of these shapes are congruent.

(a) Write down the letters of these two shapes.

A and G
..... and
(1)

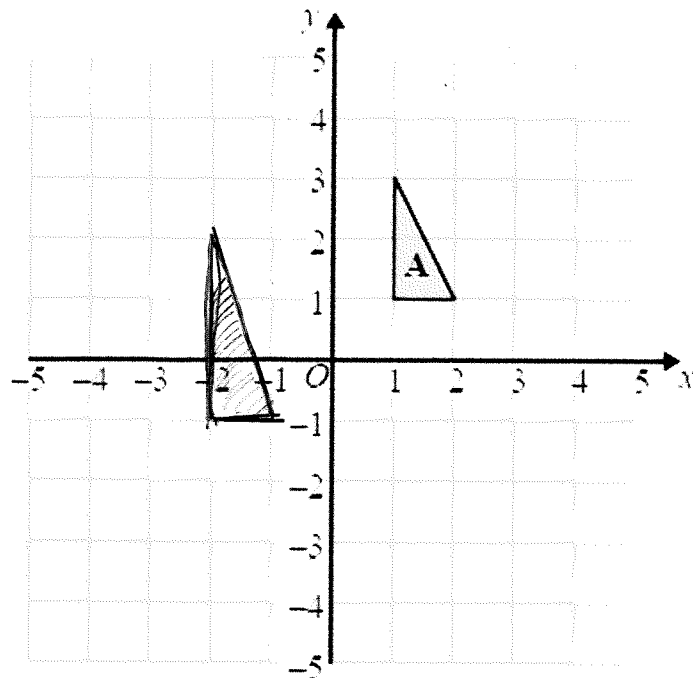
Shape H is an enlargement of one of the other shapes.

(b) Which shape?

F
.....
(1)

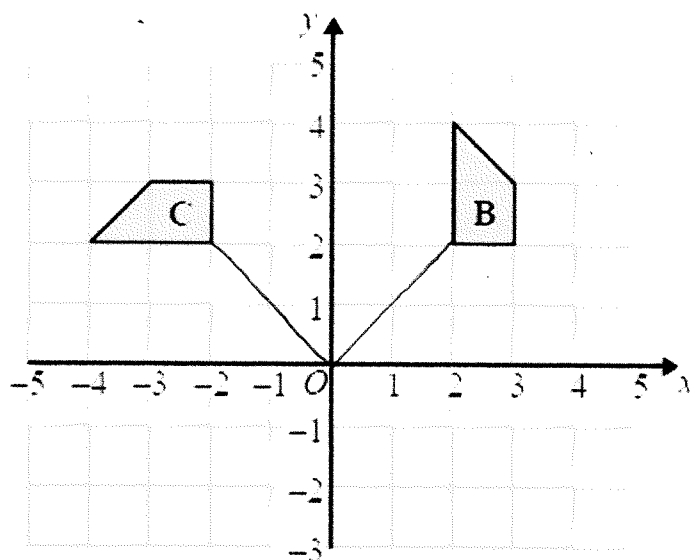
(Total for question = 2 marks)

Q27.



- (a) On the grid above, translate shape **A** by the vector $\begin{pmatrix} -3 \\ -1 \end{pmatrix}$ 3 left 1 down

(2)



- (b) Describe fully the single transformation that maps shape **B** onto shape **C**.

Rotation, 90° anticlockwise,
Centre $(0, 0)$

(3)

(Total for question = 5 marks)

Q28.

A gold bar has a mass of 12.5 kg.

The density of gold is 19.3 g/cm³

Work out the volume of the gold bar.

Give your answer correct to 3 significant figures.

$$12.5 \text{ kg} = 12500 \text{ g}$$

$$12500 \div 19.3 = 647.6683938$$

648

..... cm

(Total for question = 3 marks)

Q29.

Last year the cost of a season ticket for a football club was £560

This year the cost of a season ticket for the club has been increased to £600

Write down the increase in the cost of a season ticket as a fraction of last year's cost.

$$\text{Increase} = \pounds 40$$

$$\frac{40}{560}$$

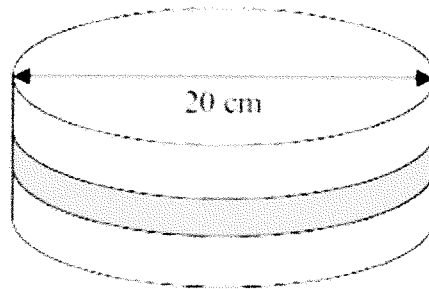
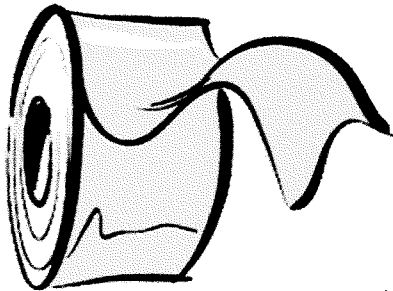
(Total for question = 2 marks)

Q30.

Susan has a round cake.

The cake has a diameter of 20 cm.

Diagram NOT
accurately drawn



Susan wants to put a ribbon round the cake.

What is the least length of ribbon she can use?

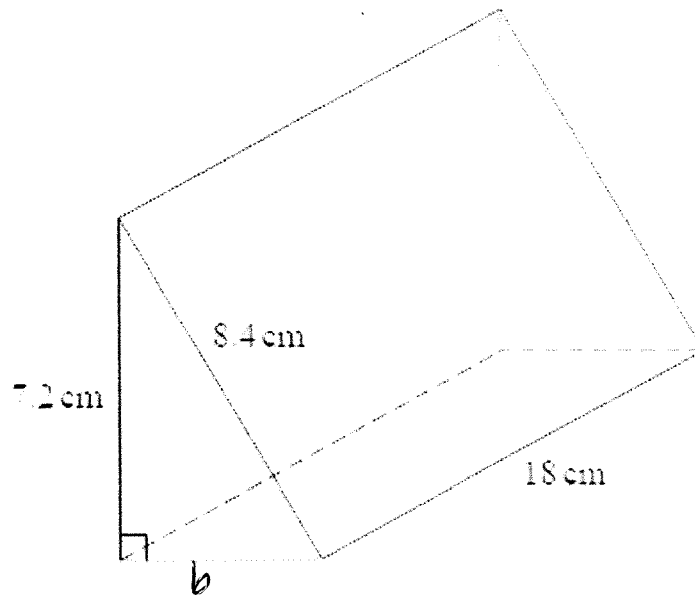
least
length = C. of circumference of circle

$$= \pi \times 20$$
$$= 62.8 \text{ cm}$$

(Total for Question is 3 marks)

Q31.

Here is a triangular prism.



Work out the volume of the prism.

Give your answer correct to 3 significant figures.

$$8.4^2 - 7.2^2 = b^2$$

$$b^2 = 18.72$$

$$b = 4.326661531 \text{ cm}$$

$$\begin{aligned} \text{Area of triangle} &= b \times 7.2 \div 2 \\ &= 15.57598151 \end{aligned}$$

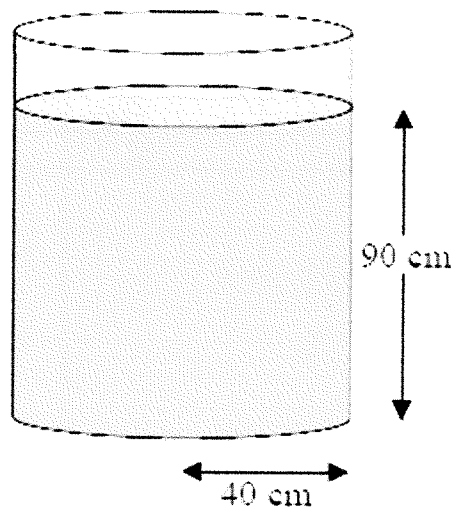
$$\begin{aligned} \text{Volume} &= \text{area} \times \text{Length} = 15.57... \times 18 \\ &= 280.367... \end{aligned}$$

$$= \underline{280} \text{ cm}^3$$

(Total for question = 5 marks)

Q32.

The diagram shows a container used to store oil.



The container is in the shape of a cylinder of radius 40 cm.

The height of the oil in the container is 90 cm.

65 litres of oil are taken from the container.

1 litre = 1000 cm³.

Work out the new height of the oil in the container.

Give your answer correct to one decimal place.

$$\text{Starting volume} = \pi \times 40^2 \times 90 = 452389.3421 \text{ cm}^3$$

$$\begin{aligned} \text{Take out } 65000 \text{ cm}^3: & 452389.3421 - 65000 \\ & = 387389.3421 \text{ cm}^3 \end{aligned}$$

New height

$$\pi \times 40^2 \times h = 387389.3421$$

$$\begin{aligned} h &= 387389.3421 \div (\pi \times 40^2) \quad 77.1 \text{ cm} \\ &= 77.068 \dots \text{ cm} \end{aligned}$$

(Total for Question is 4 marks)

Q33.

The two-way table gives some information about the drinks sold by a cafe on a Saturday and on a Sunday.

	Tea	Coffee	Squash	Total
Saturday	45	58	37	140
Sunday		47	50	159
Total		105	87	299

(a) Work out the total number of drinks sold on Sunday.

$$\text{Sunday Squash} = 87 - 37 = 50$$

$$\text{Sunday total} = 299 - 140$$

159

(1)

(b) Work out the total number of coffees sold on Saturday and Sunday.

$$\text{Saturday Coffee} = 140 - 37 - 45 = 58$$

$$\text{Total coffee} = 58 + 47 = 105$$

(2)

Rob and Mari each buy a drink at the cafe.

The cafe only sells tea, coffee and squash.

(c) Write down all the possible combinations they can choose.

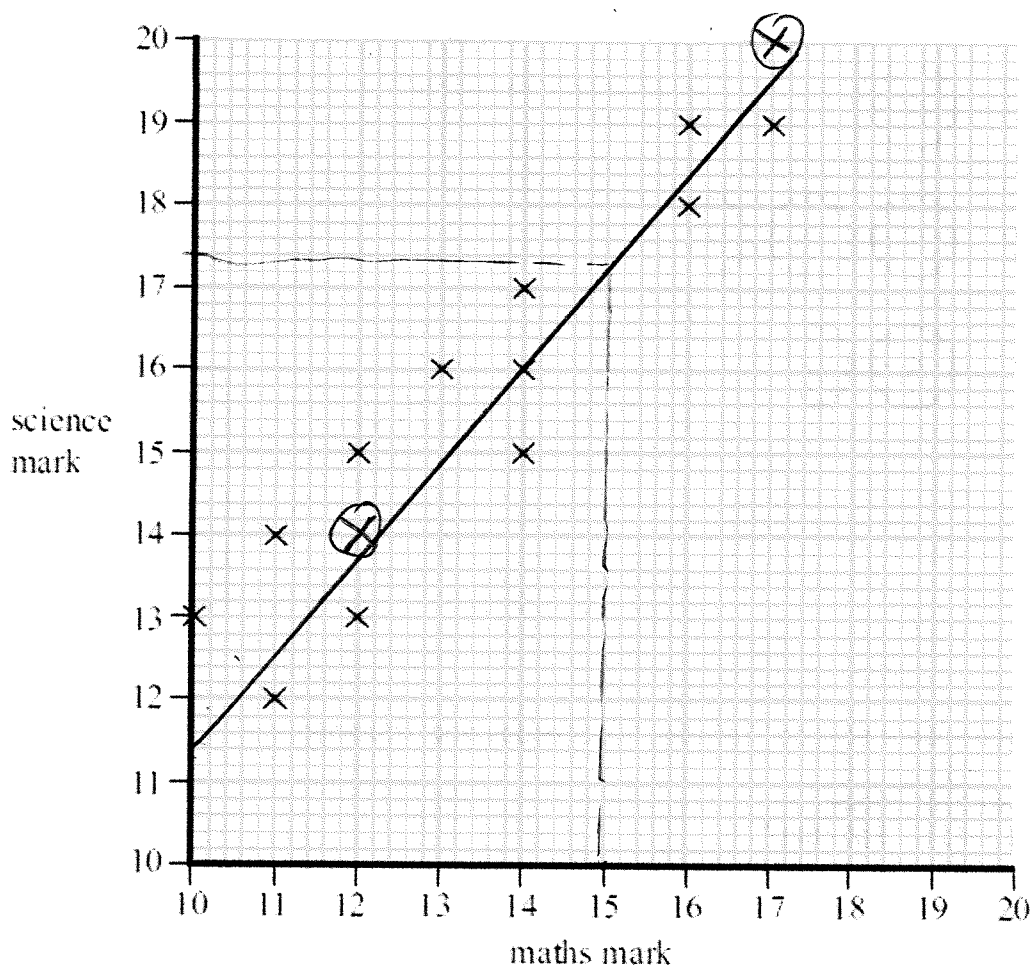
TC, TS, CT, CS, ST, SC
TT, CC, SS

(2)

(Total for Question is 5 marks)

Q34.

Mr Kent's students did a maths test and a science test.
The scatter graph shows the marks of 12 of these students.



The table shows the marks of two more students.

Name	maths	science
Masood	12	14
Nimer	17	20

(a) Show this information on the scatter graph.

(1)

(b) What type of correlation does this scatter graph show?

positive

(1)

David did the maths test.
He was absent for the science test.

David's mark in the maths test was 15

(c) Estimate a science mark for David.

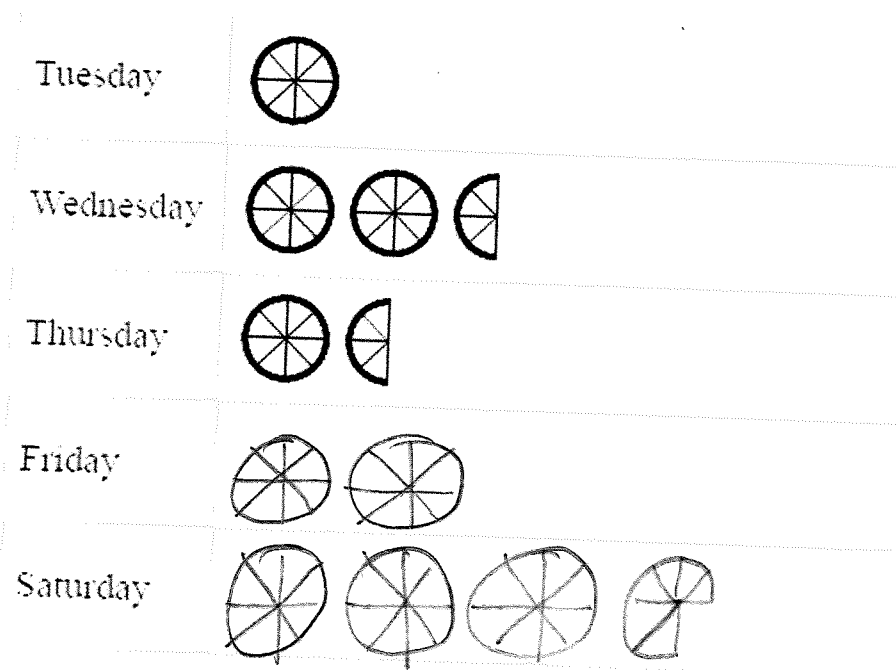
17.4 or 17.

(2)

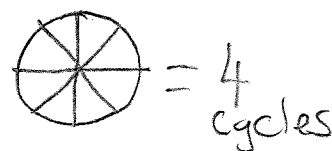
(Total for Question is 4 marks)

Q35.

The incomplete pictogram shows information about the number of cycles sold in a shop on Tuesday, on Wednesday and on Thursday.



Key:



A total of 20 cycles were sold on Tuesday, Wednesday and Thursday.

8 cycles were sold on Friday. — 2 cycles

15 cycles were sold on Saturday. 3 cycles + $\frac{3}{4}$

Use this information to complete the pictogram.

5 wheels = 20 ~~bikes~~ cycles

1 wheel = 4 cycles

(Total for question = 3 marks)

Q36.

A group of Year 10 students was asked to choose a new subject to study.

The table shows information about the choices.

Subject	Number of students	Angle
construction	40	120
hairdressing	56	168
tourism	24	72
<i>total</i>		360

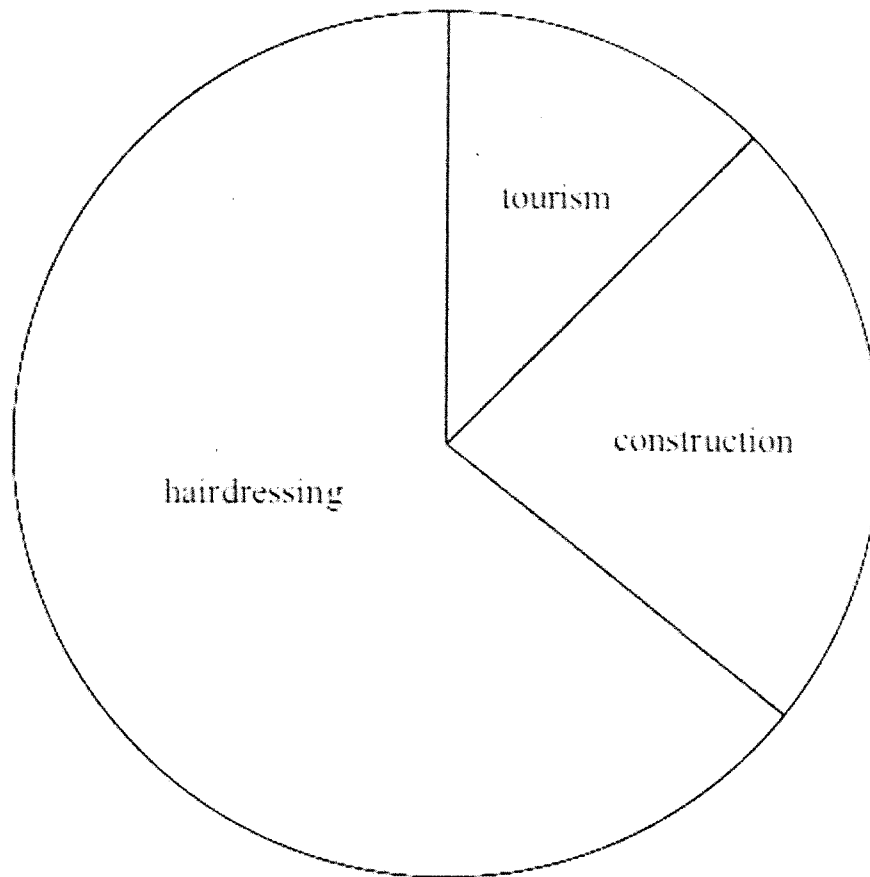
(a) Draw an accurate pie chart to show this information.



(3)

A group of Year 11 students was also asked to choose a new subject to study.

This pie chart shows information about their choices.



Danny says

"The pie charts show that hairdressing was chosen by more Year 11 students than by Year 10 students."

(b) Is Danny correct? **No**

You must explain your answer.

You don't know how many students are in year 10

(1)

(Total for Question is 4 marks)

Q37.

Steve went on holiday.

He recorded the number of photos he took each day.

Here are his results.

20 14 21 19 27 31 19 19 24 21

(a) Find the mode.

19

(1)

(b) Work out the mean.

total = 215
10 numbers

$$215 \div 10$$

21.5

(2)

Steve saves his photos on a memory card.

The memory card has 1000 megabytes of memory space.

Each photo uses 2.4 megabytes of memory space.

Steve has saved 320 photos on the memory card.

(c) Work out how many more photos Steve can save on the memory card.

$$320 \text{ photos} \times 2.4 \text{ Mb} = 768 \text{ Mb used}$$
$$1000 \text{ Mb} - 768 \text{ Mb} = 232 \text{ Mb left.}$$

$$232 \text{ Mb} \div 2.4 = 96.6$$

96

(3)

(Total for question = 6 marks)

Q38.

Here are the ages, in years, of children at a party.

6 8 6 4 5 5 6 7 4 6

(a) Work out the mean.

$$\begin{aligned} \text{total} &= 57 \\ 10 \text{ children} \\ 57 \div 10 &= 5.7 \end{aligned}$$

(2)

At the party the children were given some sausages to eat.

The table shows information about the numbers of sausages the children ate.

Number of sausages	1	2	3	4	5
Number of children	3	1	4	0	2

(b) Work out the total number of sausages the children ate.

$$3 + 2 + 12 + 0 + 10$$

27

sausages

(2)

(Total for Question is 4 marks)