

## **2017 1MA0 Practice Questions**

You're halfway there already – only one paper to go.

These questions have been compiled to help you practice topics which have not yet been tested in this exam session. You may need rough paper for some working out.

Of course, ANY topic can turn up on either paper, but these questions may help focus your revision.

Don't forget your calculator on THURSDAY 8<sup>th</sup> JUNE.

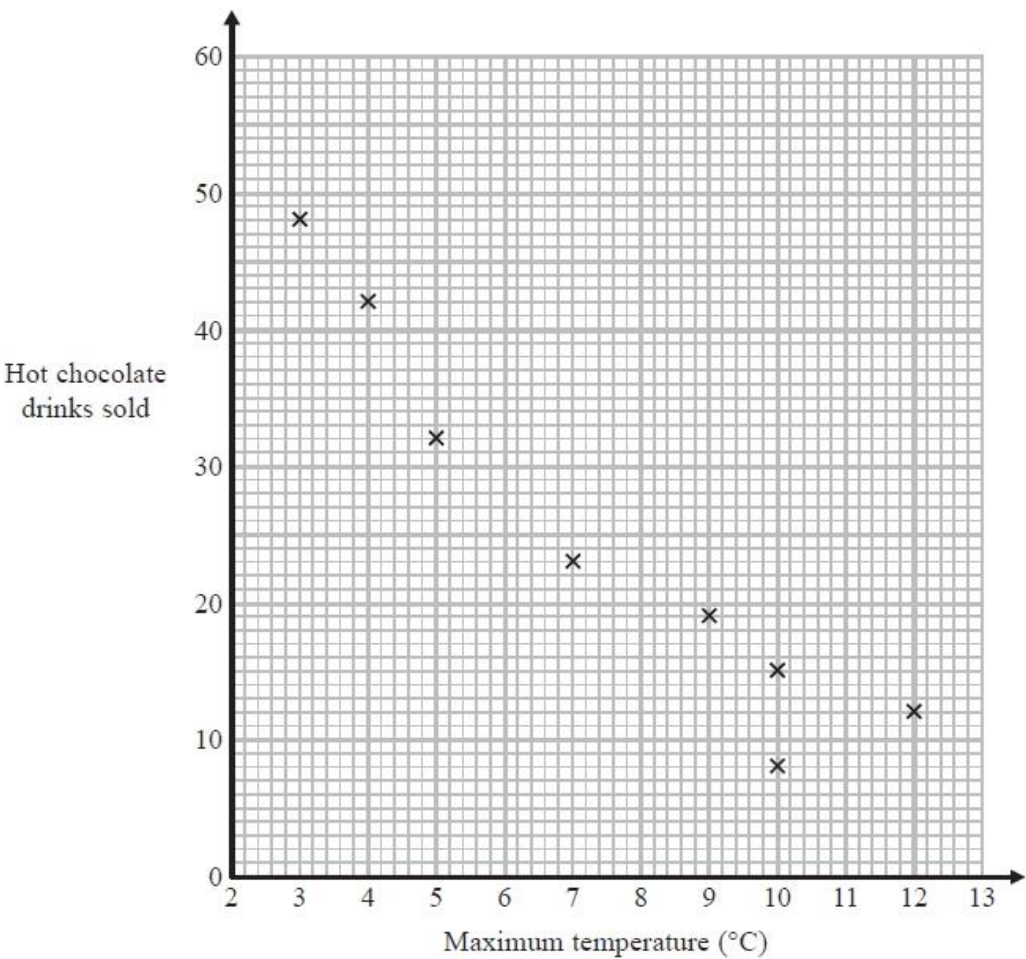
GOOD LUCK!



Emma Bell.

Q1.

Carlos has a cafe in Clacton.  
Each day, he records the maximum temperature in degrees Celsius ( $^{\circ}\text{C}$ ) in Clacton and the number of hot chocolate drinks sold. The scatter graph shows this information.



On another day the maximum temperature was  $6^{\circ}\text{C}$  and 35 hot chocolate drinks were sold.

(a) Show this information on the scatter graph.

(1)

(b) Describe the relationship between the maximum temperature and the number of hot chocolate drinks sold.

.....  
.....

(1)

(c) Draw a line of best fit on the scatter diagram.

(1)

One day the maximum temperature was  $8^{\circ}\text{C}$ .

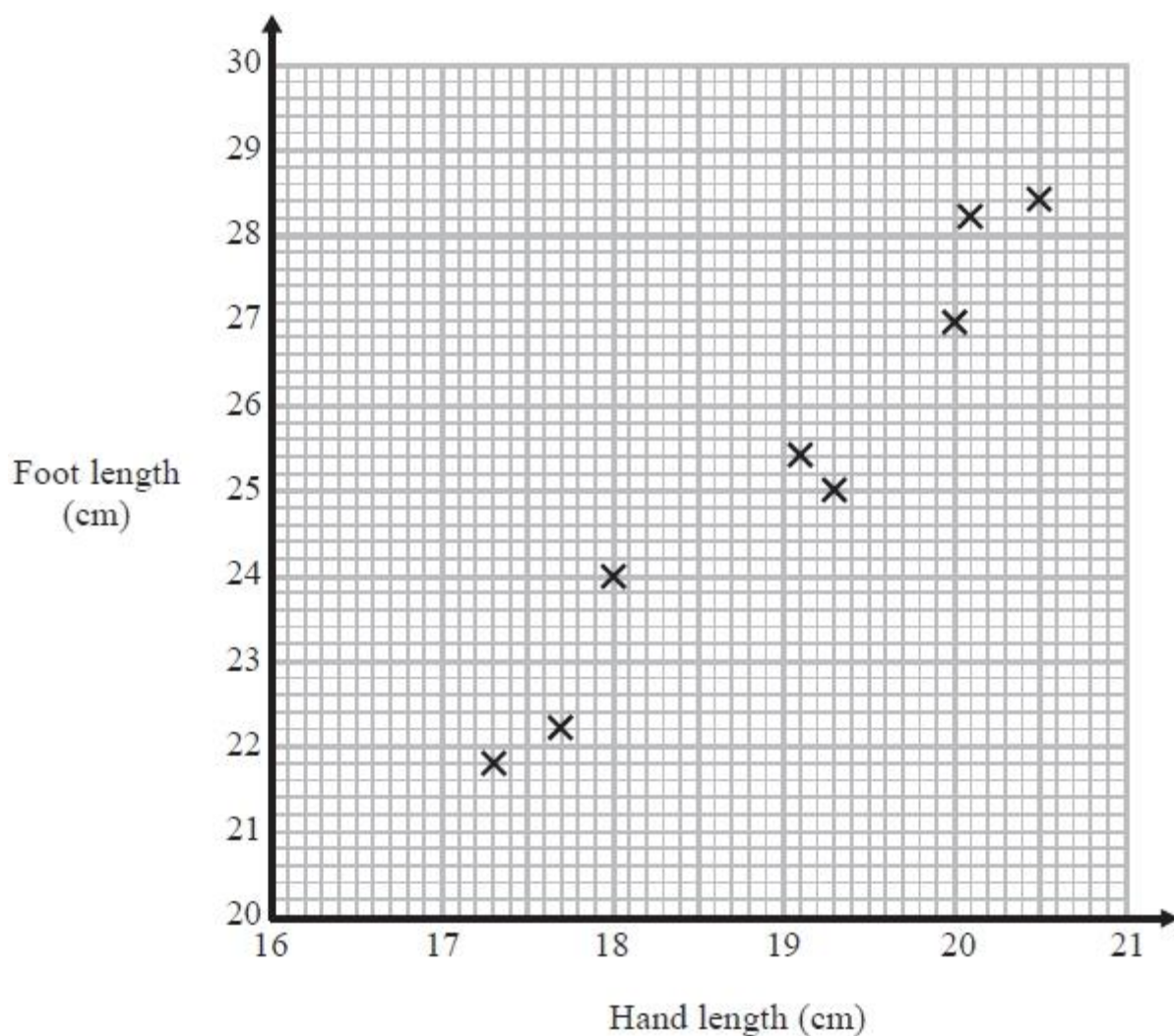
(d) Use your line of best fit to estimate how many hot chocolate drinks were sold.

.....  
(1)

(Total for Question is 4 marks)

**Q2.**

The scatter graph gives information about the hand length and the foot length of each of 8 people.



(a) Describe the relationship between the hand length and the foot length of these people.

.....  
.....

(1)

Toby has a hand length of 18.5 cm.

(b) Find an estimate for Toby's foot length.

..... cm

(2)

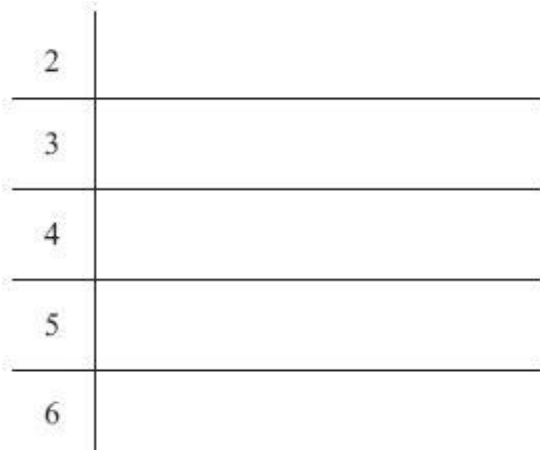
**(Total for question = 3 marks)**

**Q3.**

Here are the heights, in cm, of some potato plants.

20	35	48	37	25	56	65	42
34	28	25	32	54	62	39	45

Draw an ordered stem and leaf diagram to show this information.



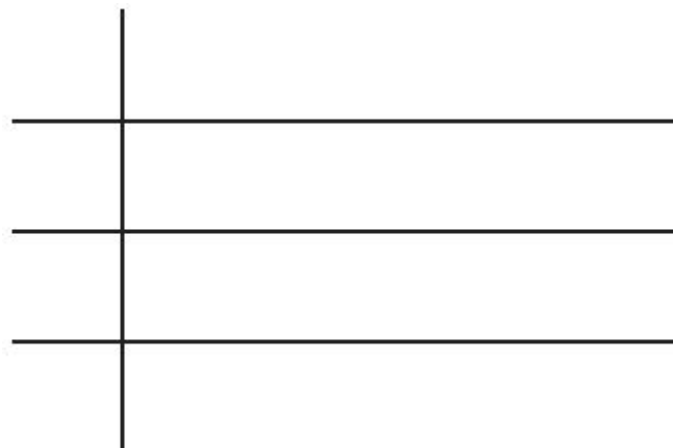
(Total for Question is 3 marks)

**Q4.**

Here are the heights, in centimetres, of 15 children.

123	147	135	150	147
129	148	149	125	137
133	138	133	130	151

Show this information in an ordered stem and leaf diagram.



(Total for question = 3 marks)

Q5.

The table gives some information about the weights, in kg, of 50 suitcases at an airport check-in desk.

Weight ( $w$ kg)	Frequency
$0 < w \leq 10$	16
$10 < w \leq 15$	18
$15 < w \leq 20$	10
$20 < w \leq 35$	6

(a) Work out an estimate for the mean weight.

..... kg  
(4)

Passengers have to pay extra money for any suitcase that weighs more than 20 kg.  
Two of the 50 suitcases are chosen at random.

(b) Work out the probability that both suitcases weigh more than 20 kg.

.....  
(2)

(Total for Question is 6 marks)

Q6.

The table gives information about the areas, in  $\text{cm}^2$ , of some growths of mould in an experiment.

Area ( $a \text{ cm}^2$ )	Frequency
$0 < a \leq 5$	4
$5 < a \leq 10$	7
$10 < a \leq 15$	9
$15 < a \leq 20$	15

(a) Write down the class interval that contains the median area.

.....  
(1)

(b) Work out an estimate for the mean area.

..... $\text{cm}^2$   
(4)

(Total for question = 5 marks)

**Q7.**

The table gives information about the numbers of badges gained by the younger girls in a Guide group.

Number of badges	Frequency
0	2
1	8
2	4
3	3
4	5
5	3

(a) Write down the mode.

.....  
(1)

(b) Work out the mean number of badges gained by these girls.

.....  
(3)

There are 15 older girls in the Guide group.  
The mean number of badges gained by these 15 older girls is 4.4

(c) Work out the mean number of badges gained by all the girls in the Guide group.

.....  
(3)  
(Total for question = 7 marks)

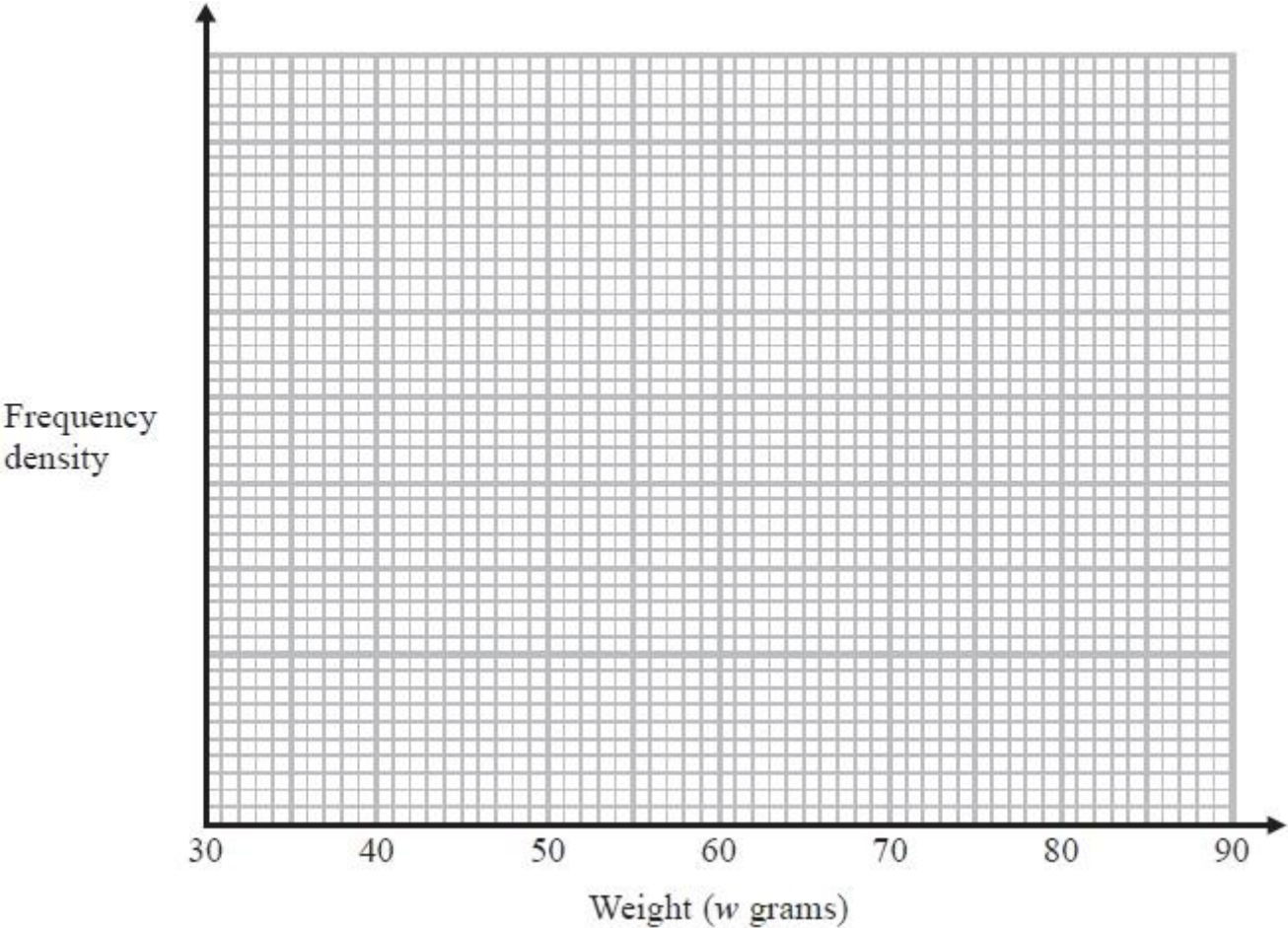
**Q8.**

Billy keeps chickens.

The table shows information about the weights, in grams, of eggs produced by the chickens.

Weight ( $w$ grams)	$30 < w \leq 50$	$50 < w \leq 60$	$60 < w \leq 70$	$70 < w \leq 85$
Number of eggs	12	20	17	6

(a) On the grid, draw a histogram for this information.



(3)

Medium eggs weigh between 53grams and 63grams.

(b) Work out an estimate for the number of medium eggs produced.

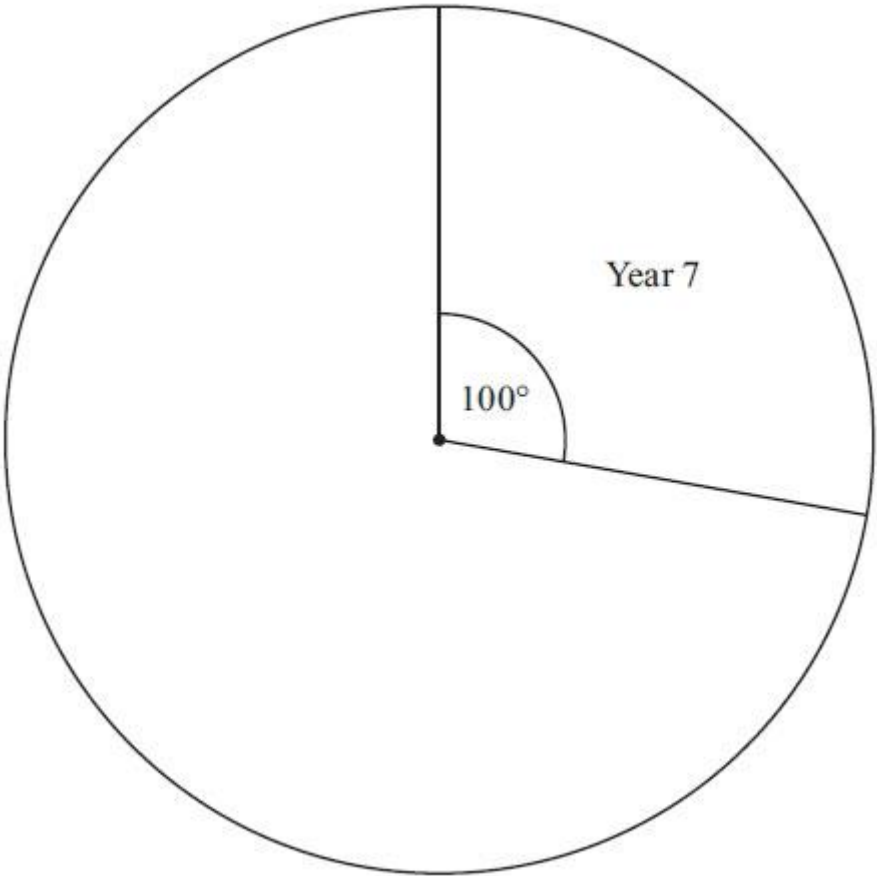
.....  
(3)

(Total for question = 6 marks)

**Q9.**

Each year group in a school raised money for charity.  
The incomplete table and pie chart show some information about this.  
Complete the table.

Year Group	Amount raised
7	.....
8	£225
9	.....
10	£125
11	£162.50
	£900



(Total for Question is 3 marks)



**Q10.**

An electronic game can show red or blue or green or yellow.

The table shows the probabilities that the colour shown will be red or will be green or will be yellow.

Colour	red	blue	green	yellow
Probability	0.15		0.41	0.24

Arthur plays the game.

- (a) Work out the probability that the colour shown will be blue.

.....  
(2)

Janice is going to play the game 50 times.

- (b) Work out an estimate for the number of times the colour shown will be yellow.

.....  
(2)

**(Total for question = 4 marks)**

**Q11.**

There are only red counters, yellow counters, blue counters and green counters in a bag.  
Olu takes at random a counter from the bag.

The table shows each of the probabilities.

Colour	Red	Yellow	Blue	Green
Probability	0.6	0.25	$2x$	$x$

The probability that Olu will take a blue counter is twice the probability that he will take a green counter.

- (a) Work out the value of  $x$ .

.....  
(3)

Olu takes a counter from the bag.  
He writes down the colour of the counter.  
He puts the counter back in the bag.

Olu does this 50 times.

- (b) Work out an estimate for the number of times that Olu takes a red counter from the bag.

.....  
(2)

**(Total for question = 5 marks)**

**Q12.**

On an activity day students play one sport.

They play football or hockey or tennis.

120 students are on the activity day.

30 of the students are boys.

12 of the boys and 26 of the girls play hockey.

45 of the students play football.

35 of the 45 students who play football are girls.

Work out the number of girls who play tennis.

.....  
(Total for Question is 4 marks)

**Q13.**

James wants to find out how long his friends spend using the internet.

He uses this question on his questionnaire.

How many hours do you spend using the internet?

1 – 55 – 1010 – 20

a) Write down two things wrong with this question.

1  
.....  
.....

2  
.....  
.....

(2)

(b) Write a better question for James to use on his questionnaire to find out how long his friends spend using the internet.

(2)

(Total for Question is 4 marks)

Q14.

Helen carries out a survey on healthy eating.  
She uses these two questions in a questionnaire.

question 1

What is your age?

under 20

20 to 40

40 to 60

over 60

question 2

You should eat fruit every day. You do agree, don't you?

Yes

No

Don't know

a) Write down **one** thing wrong with each of these questions.  
question 1

question 2

(2)

Helen wants to find out the amount of fruit people eat.

(b) Design a question that Helen could use in her questionnaire.

(2)

The table shows some information about the people at Helen's college.

	Student	Teacher
Male	536	48
Female	384	73

Helen is going to ask people at her college to do her questionnaire.  
She asks a sample of 100 people stratified by type and gender.

(c) Work out the number of female teachers in her sample.

(2)

(Total for Question is 6 marks)

**Q15.**

120 children went on a school activities day.

Some children went bowling.

Some children went to the cinema.

The rest of the children went skating.

66 of these children were girls.

28 of the 66 girls went bowling.

36 children went to the cinema.

20 of the children who went to the cinema were girls.

15 boys went skating.

Work out the number of children who went bowling.

.....  
(Total for Question is 4 marks)

**Q16.**

There are a total of 96 children in Years 4, 5 and 6  
37 of these children cannot swim.

11 children in Year 4 cannot swim.

21 children in Year 5 can swim.

There are 30 children in Year 6

18 of these 30 children can swim.

(i) Work out the number of children in Year 4 who can swim.

.....

(ii) Work out the total number of children in Year 5

.....

**(Total for Question is 4 marks)**

**Q17.**

The table below shows the population of each of three villages.

Village	Population
Ashley	243
Brigby	370
Hinckley	127

Mr Akhtar carries out a survey of the people living in these three villages.  
He uses a sample stratified by village population.

There are 50 people from Brigby in his sample.

Work out the number of people from Irton in his sample.

.....

**(Total for Question is 2 marks)**

**Q18.**

\* Toga wants to estimate the number of termites in a nest.

On Monday Toga catches 80 termites.

He puts a mark on each termite.

He then puts all 80 termites back in the nest.

On Tuesday Toga catches 60 termites.

12 of these termites have a mark on them.

Work out an estimate for the total number of termites in the nest.

You must write down any assumptions you have made.

.....  
(Total for question = 4 marks)

**Q19.**

156 students went to London.

Each student visited one of the British Museum or the National Gallery or the Stock Exchange.

The table gives information about these students.

	Place visited		
	British Museum	National Gallery	Stock Exchange
Male	25	18	35
Female	27	32	19

Kate takes a sample of 30 of these students.

The sample is stratified by place visited and by gender.

Work out the number of male students who visited the Stock Exchange in the sample.

.....  
(Total for Question is 2 marks)

**Q20.**

On Monday, a shop sells 120 loaves of bread.

20% of the loaves are wholemeal bread.

$\frac{1}{3}$  of the loaves are granary bread.

The rest of the loaves are white bread.

How many loaves of white bread does the shop sell on Monday?

.....

**(Total for Question is 3 marks)**

**Q21.**

\* Ketchup is sold in three different sizes of bottle.



A small bottle contains 342 g of ketchup and costs 88p

A medium bottle contains 570 g of ketchup and costs £1.95

A large bottle contains 1500 g of ketchup and costs £3.99

Which bottle is the best value for money?

You must show your working.

**(Total for Question is 4 marks)**

**Q22.**

\* A shop sells toothpaste in 3 different sizes of tube.

A 70 m/ tube of toothpaste costs £1.79

A 100 m/ tube of toothpaste costs £2.75

A 150 m/ tube of toothpaste costs £3.99

Which size of tube is the best value for money?

You must show all your working.

**(Total for Question is 4 marks)**

**Q23.**

Callum has £240

He wants to buy some tickets that cost 10 euros each.

The exchange rate is     £1 = 1.20 euros.

Work out the greatest number of tickets that Callum can buy.

.....

**(Total for question = 3 marks)**

**Q24.**

Tony has a hosepipe.

The length of the hosepipe is 20 m.

Tony stores the hosepipe on a reel.

The weight of the reel is 1.4 kg.

$\frac{1}{2}$  metre of the hosepipe has a weight of 150 grams.

Work out the total weight of the hosepipe and the reel.

..... kg

**(Total for Question is 3 marks)**



**Q25.**

\* Matches are sold in three sizes of box.

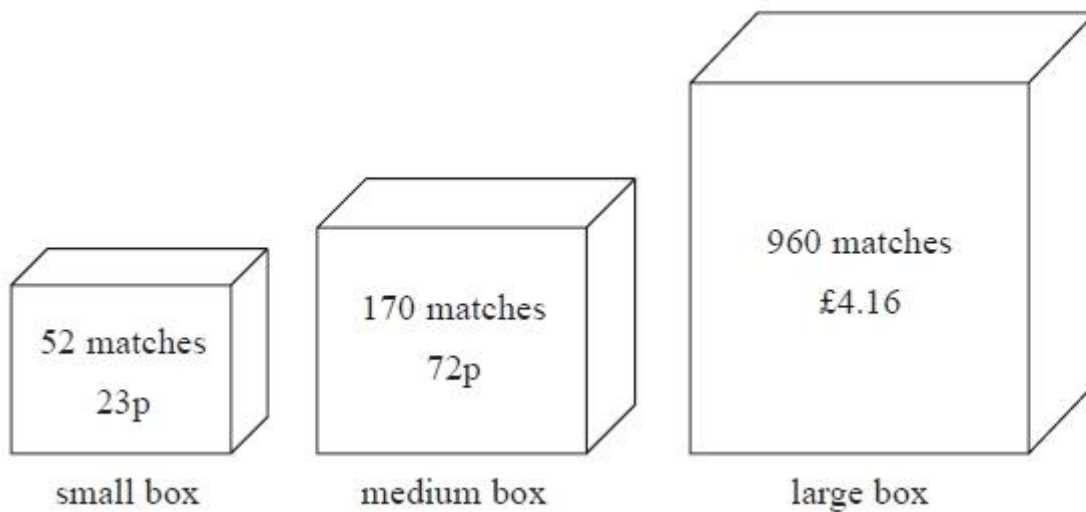


Diagram NOT  
accurately drawn

A small box contains 52 matches and costs 23p.  
A medium box contains 170 matches and costs 72p.  
A large box contains 960 matches and costs £4.16

Which size of box is the best value for money?  
Show how you got your answer.

**(Total for question = 4 marks)**

**Q26.**

Charlie invests £1200 at 3.5% per annum compound interest.  
Work out the value of Charlie's investment after 3 years.

£. . . . .

**(Total for Question is 3 marks)**

**Q27.**

Jane invests £300 at a simple interest rate of 4.5% per year.  
At the end of each year Jane gives the interest to a charity.

Work out the least number of years it will take for the total amount given to the charity to be greater than £50

.....

**(Total for question = 3 marks)**

**Q28.**

Here is a list of ingredients for making 12 cheese scones.

Ingredients for 12 cheese scones	
240 g	flour
60 g	butter
30 g	cheese
150 m/	milk

Jason is going to make 30 cheese scones.

Work out the amount of each ingredient he needs.

.....  
.....  
.....

milk. .... m/

**(Total for Question is 3 marks)**

**Q29.**

The cost of 6 cups is £7.80

Work out the cost of 10 of these cups.

.....

**(Total for Question is 2 marks)**

**Q30.**

Here are the ingredients needed to make 30 biscuits.

Biscuits	
Ingredients to make 30 biscuits	
400 g	of flour
320 g	of butter
180 g	of sugar

Helen wants to make 20 biscuits.

(a) How much sugar does Helen need?

..... g

**(2)**

John has 1 kg of flour and enough of the other ingredients.

(b) Work out the greatest number of biscuits John can make.

.....  
(2)

(Total for question = 4 marks)

**Q31.**

$$\frac{\sqrt{30}}{2.5^2}$$

(a) Work out the value of

Give your answer correct to 3 decimal places.

.....  
(2)

(b) Change 4.5 km<sup>2</sup> to m<sup>2</sup>.

.....m<sup>2</sup>  
(2)

(Total for Question is 4 marks)

**Q32.**

(a) Write down the reciprocal of 5

.....  
(1)

(b) Evaluate 3<sup>-2</sup>

.....  
(1)

(c) Calculate 9×10<sup>4</sup>×3×10<sup>3</sup>

Give your answer in standard form.

.....  
(2)

(Total for Question is 4 marks)

**Q33.**

Work out an estimate for the value of  $\frac{89.3 \times 0.51}{4.8}$

.....  
(Total for Question is 2 marks)

**Q34.**

\*

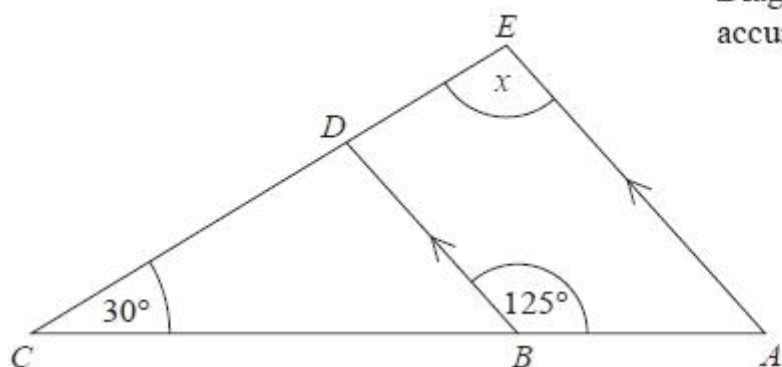


Diagram NOT  
accurately drawn

*ABC* and *EDC* are straight lines.

*AE* and *BD* are parallel.

Angle *ABD* =  $125^\circ$

Angle *BCD* =  $30^\circ$

Work out the size of the angle marked *x*.

Give reasons for your answer.

(Total for question = 4 marks)

**Q35.**

The diagram shows 3 sides of a regular polygon.

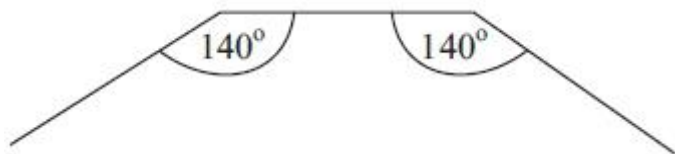


Diagram **NOT** accurately drawn

Each interior angle of the regular polygon is  $140^\circ$ .

Work out the number of sides of the regular polygon.

.....  
(Total for Question is 3 marks)

**Q36.**

\*

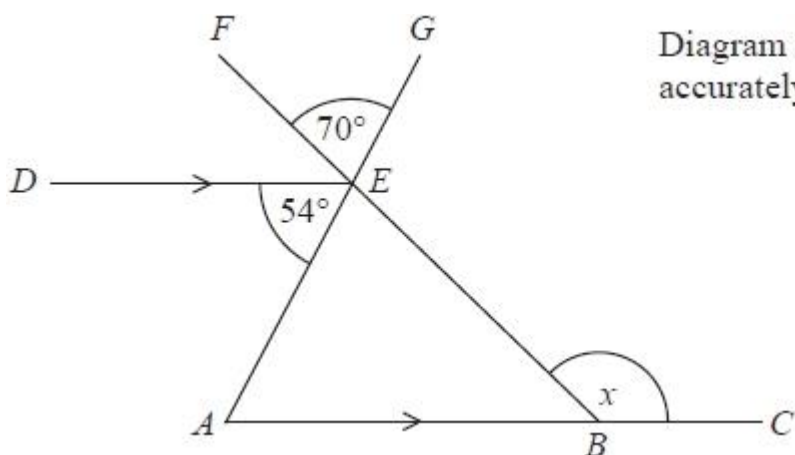


Diagram **NOT**  
accurately drawn

$ABC$  and  $DE$  are parallel lines.

$AEG$  and  $BEF$  are straight lines.

Angle  $AED = 54^\circ$

Angle  $FEG = 70^\circ$

Work out the size of the angle marked  $x$ .

Give a reason for each stage of your working.

(Total for question = 4 marks)

**Q37.**

Tom and Amy set the alarms on their phones to sound at 6.45 am.

Both alarms sound together at 6.45 am.

Tom's alarm then sounds every 9 minutes.

Amy's alarm then sounds every 12 minutes.

At what time will both alarms next sound together?

**(Total for question = 3 marks)**

**Q38.**

Caroline is making some table decorations. Each decoration is made from a candle and a holder.



candle and  
holder

Caroline buys some candles and some holders each in packs.

There are 30 candles in a pack of candles.

There are 18 holders in a pack of holders.

Caroline buys exactly the same number of candles and holders.

(i) How many packs of candles and how many packs of holders does Caroline buy?

..... packs of candles

..... packs of holders

Caroline uses all her candles and all her holders.

(ii) How many table decorations does Caroline make?

..... table decorations

**(Total for question = 5 marks)**

**Q39.**

- (a) Express 180 as a product of its prime factors.

.....  
(3)

Martin thinks of two numbers.

He says,

"The Highest Common Factor (HCF) of my two numbers is 6

The Lowest Common Multiple (LCM) of my two numbers is a multiple of 15"

- (b) Write down **two** possible numbers that Martin is thinking of.

..... , .....  
(2)

**(Total for Question is 5 marks)**

**Q40.**

The bearing of a ship from a lighthouse is  $050^\circ$

Work out the bearing of the lighthouse from the ship.

**(Total for Question is 2 marks)**

**Q41.**

Manchester airport is on a bearing of  $330^\circ$  from a London airport.

- (a) Find the bearing of the London airport from Manchester airport.

..... $^\circ$   
(2)

The London airport is 200 miles from Manchester airport.

A plane leaves Manchester airport at 10 am to fly to the London airport.

The plane flies at an average speed of 120 mph.

- (b) What time does the plane arrive at the London airport?

.....  
(4)

**(Total for question = 6 marks)**

**Q42.**



Use ruler and compasses to **construct** the perpendicular bisector of the line segment  $AB$ .  
You must show all your construction lines.

**(Total for question = 2 marks)**



**Q43.**

Here is a scale drawing of an office.  
The scale is 1 cm to 2 metres.



A photocopier is going to be put in the office.  
The photocopier has to be closer to *B* than it is to *A*.  
The photocopier also has to be less than 8 metres from *C*.  
Show, by shading, the region where the photocopier can be put.

**(Total for question = 3 marks)**

**Q44.**

\* The diagram shows a flower bed in the shape of a circle.

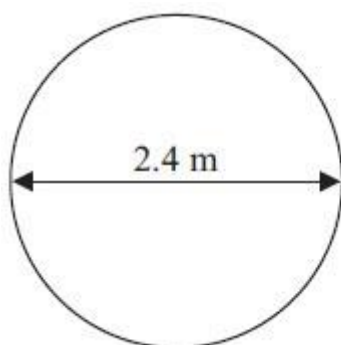


Diagram **NOT**  
accurately drawn

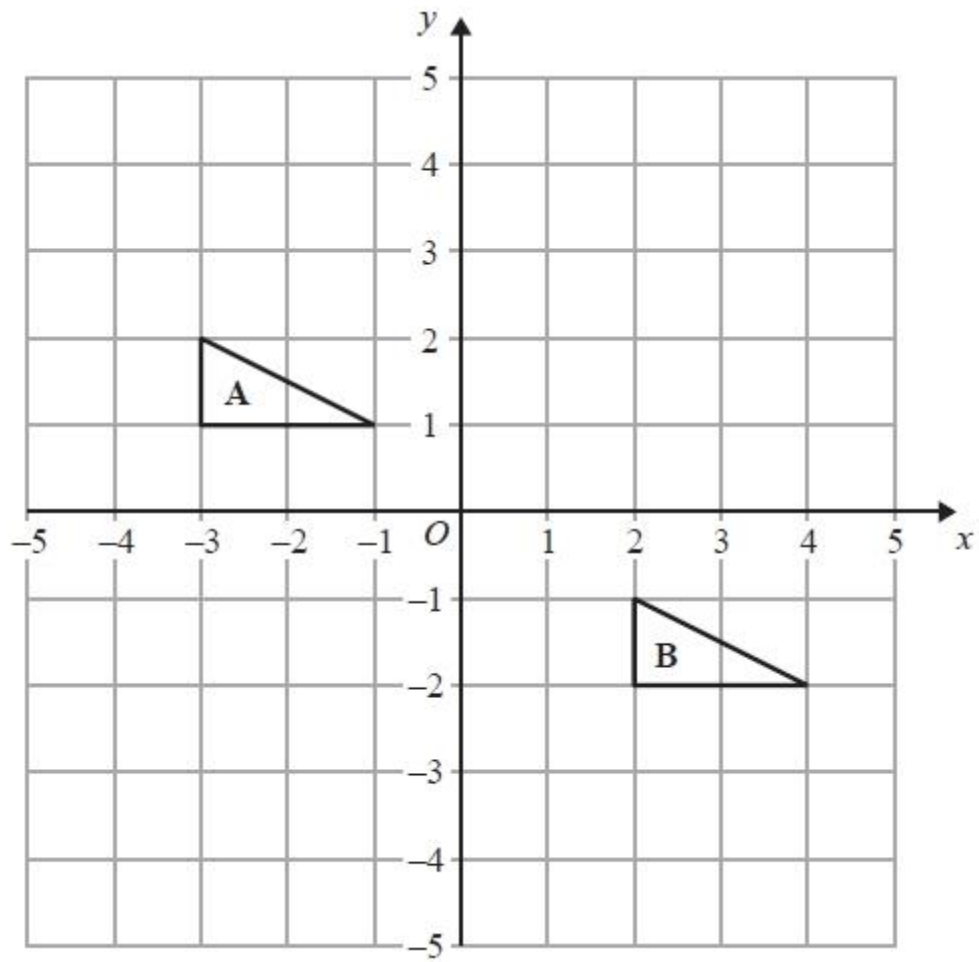
The flower bed has a diameter of 2.4 m.

Sue is going to put a plastic strip around the edge of the flower bed.  
The plastic strip is sold in 2 metre rolls.

How many rolls of plastic strip does Sue need to buy?  
You must show all your working.

**(Total for Question is 4 marks)**

Q45.



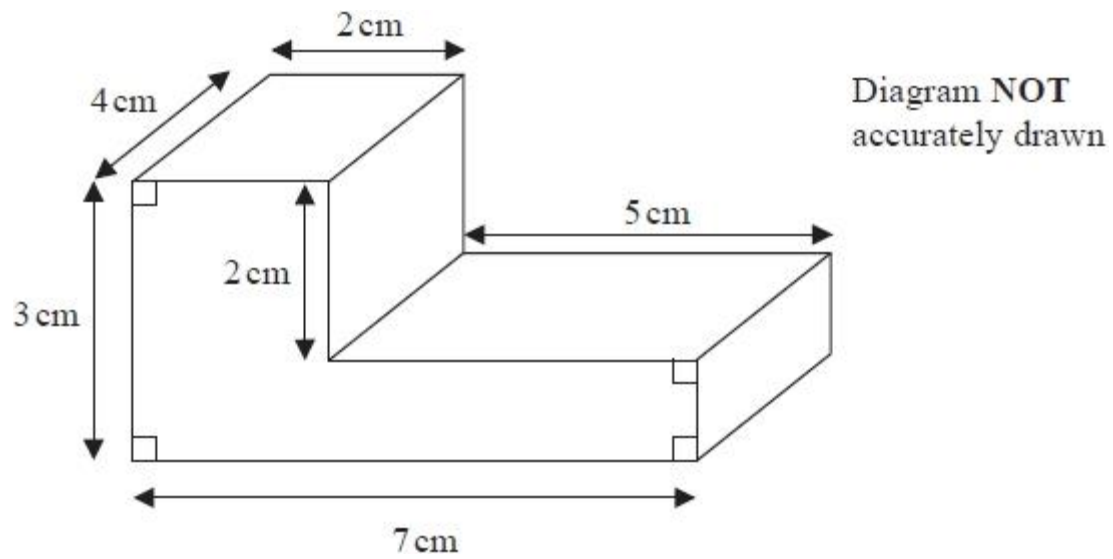
Describe the single transformation that maps triangle **A** onto triangle **B**.

.....  
.....

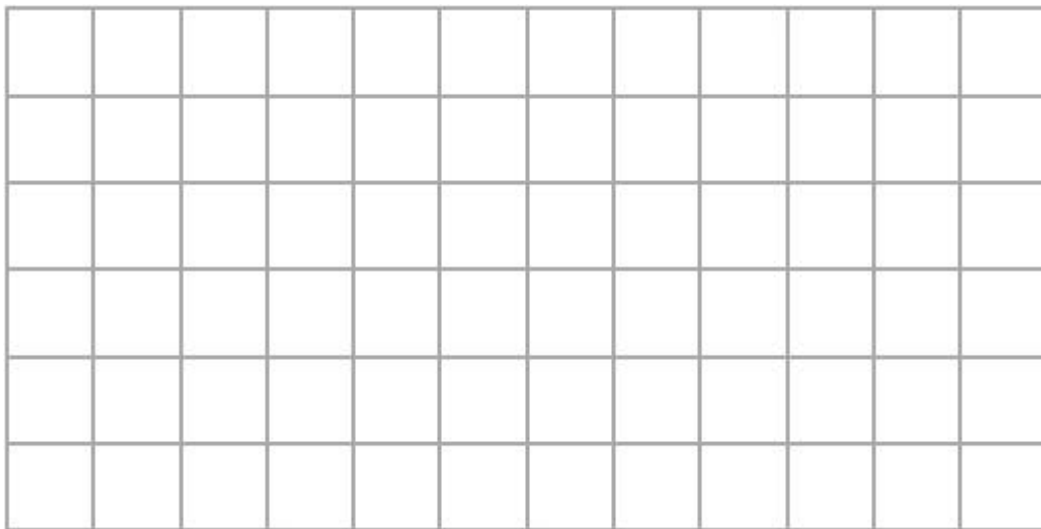
(Total for Question is 2 marks)

**Q46.**

The diagram shows a solid prism.



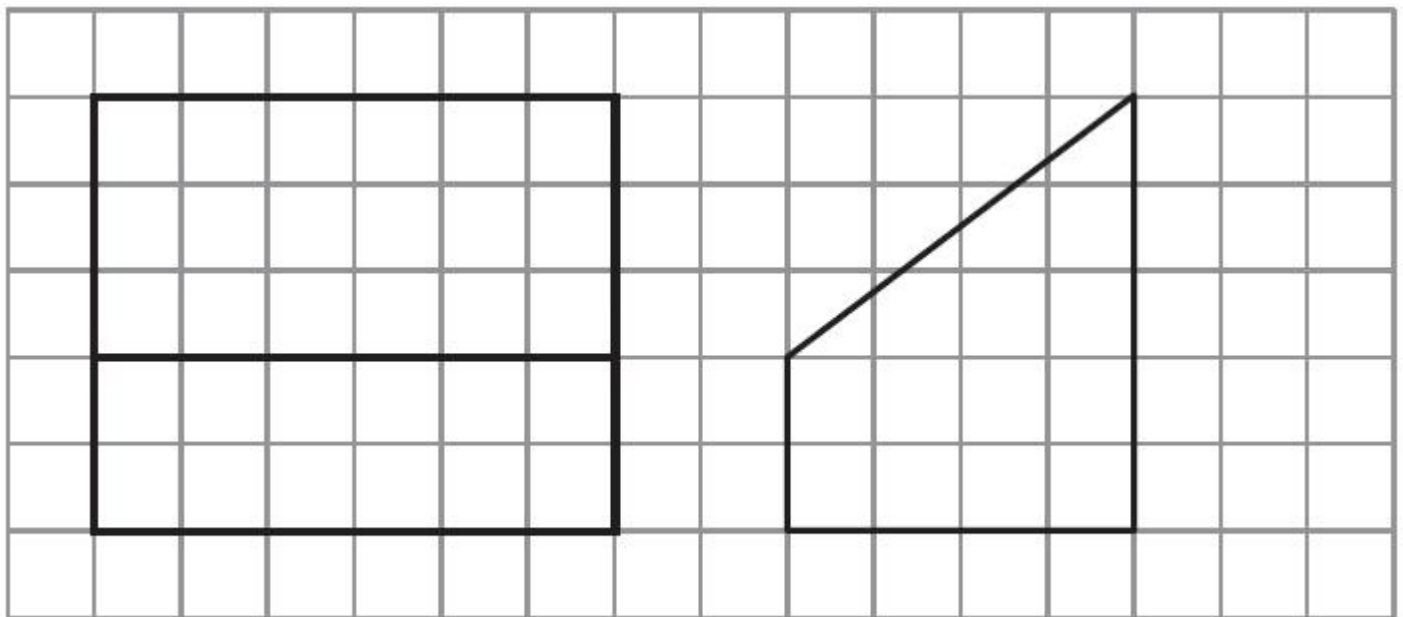
On the grid, draw an accurate plan of the solid prism.



**(Total for question = 2 marks)**

**Q47.**

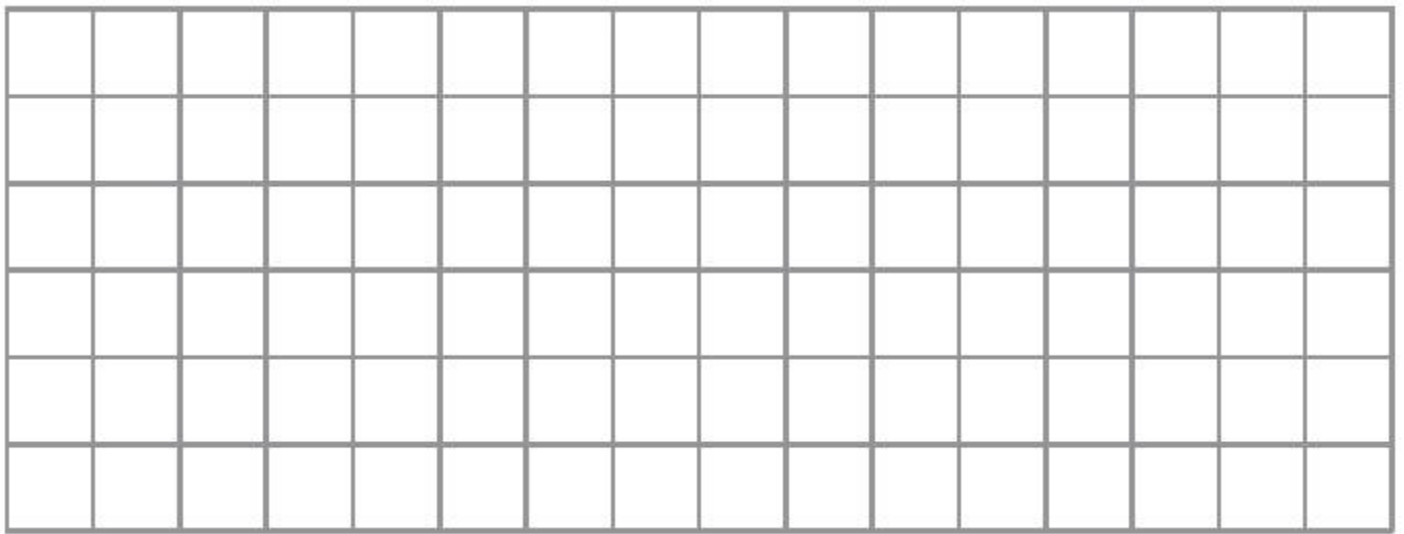
The diagram shows the front elevation and the side elevation of a prism.



Front elevation

Side elevation

(a) On the grid, draw a plan of this prism.



(2)

(b) In the space below, draw a sketch of this prism.

(2)

**(Total for Question is 4 marks)**

**Q48.**

Make  $t$  the subject of the formula

$$p = \sqrt{\frac{3t}{a}}$$

**(Total for question = 3 marks)**

**Q49.**

Make  $q$  the subject of the formula  $r = \frac{2q - 4}{3}$

**(Total for question = 3 marks)**

**Q50.**

(a) Simplify  $3y + 2x - 4 + 5x + 7$

(1)

(b) Factorise  $2x^2 - 4x$

(2)

(c) Expand and simplify  $11 - 3(x + 2)$

(2)

(d) Expand and simplify  $(x - 6)(3x + 7)$

(2)

**(Total for Question is 7 marks)**

**Q51.**

(a) Expand  $3(x + 2)$

(2)

(b) Factorise completely  $12x^3y - 18xy^2$

(2)

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

(2)

(d) Simplify  $5x^4y^3 \times 2x^3y^2$

(2)

**(Total for Question is 8 marks)**

**Q52.**

(a) Factorise fully  $6ab + 10ac$

(2)

(b) Expand and simplify  $(x - 5)(x + 7)$

(2)

(c) Simplify  $\frac{2m^2t^6}{m^4t^2}$

Give your answer in its simplest form.

(2)

(d) Factorise  $y^2 - 16$

(1)

(e) Simplify  $(h^2)^{-3}$

(1)

**(Total for Question is 8 marks)**

**Q53.**

The equation  $x^3 - 9x = 48$   
has a solution between 4 and 5

Use a trial and improvement method to find the solution.  
Give your answer correct to one decimal place.  
You must show **all** your working.

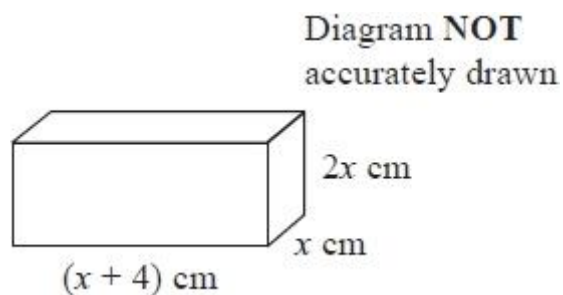
$x = \dots\dots\dots$

**(Total for question = 4 marks)**

**Q54.**

A cuboid has dimensions  $2x$  cm,  $x$  cm and  $(x + 4)$  cm.

The volume of the cuboid is  $180 \text{ cm}^3$ .



(a) Show that  $x^3 + 4x^2 = 90$

(2)

The equation  $x^3 + 4x^2 = 90$  has a solution between  $x = 3$  and  $x = 4$

(b) Use a trial and improvement method to find this solution.

Give your answer correct to 1 decimal place.

You must show all your working.

.....  
(4)

(Total for question = 6 marks)



**Q55.**

The equation

$$x^3 - x = 32$$

has a solution between 3 and 4

Use a trial and improvement method to find this solution.

Give your solution correct to one decimal place.

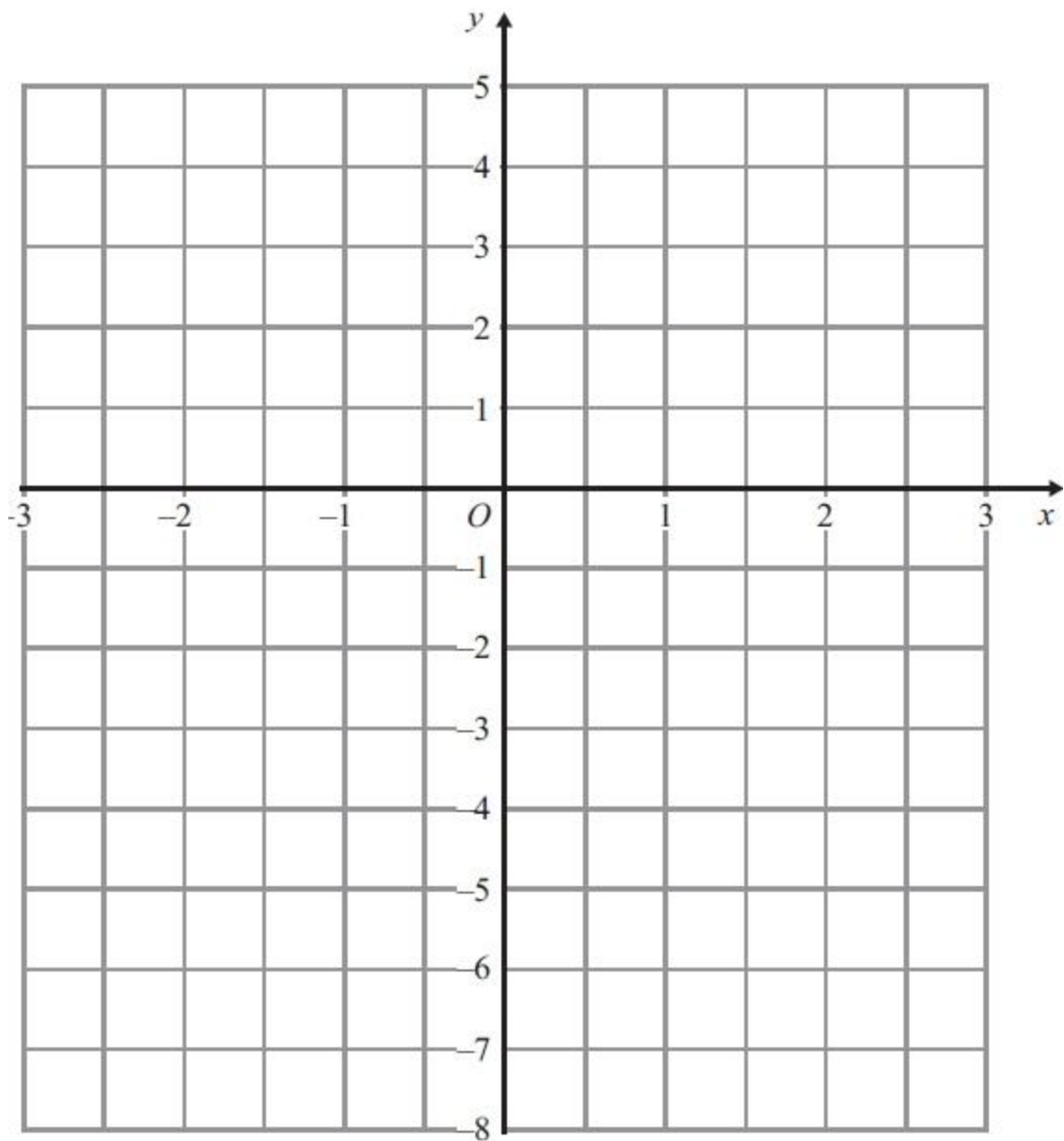
You must show **all** your working.

$x = \dots\dots\dots$

**(Total for Question is 4 marks)**

**Q56.**

On the grid, draw the graph of  $y = 2x - 3$  for values of  $x$  from  $-2$  to  $2$



**(Total for Question is 3 marks)**

**Q57.**

$$-2 \leq n < 3$$

$n$  is an integer.

(a) Write down all the possible values of  $n$ .

(2)

(b) Solve  $4 - x < 2x - 5$

(2)

**(Total for question = 4 marks)**

**Q58.**

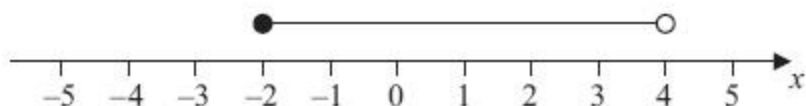
$$-4 < n \leq 1$$

$n$  is an integer.

(a) Write down all the possible values of  $n$ .

(2)

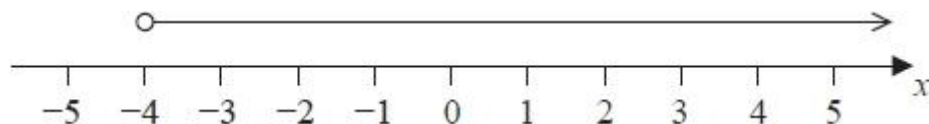
(b) Write down the inequalities represented on the number line.



(2)

**(Total for Question is 4 marks)**

**Q59.**



(a) Write down the inequality represented on the number line.

(1)

(b) Solve  $4y - 9 \leq 3$

(2)

(c)

$$-3 \leq n < 2$$

$$-2 < m < 4$$

$n$  and  $m$  are integers.

Given that  $n = m$ , write down all the possible values of  $n$ .

(2)

**(Total for question = 5 marks)**

**Q60.**

$GHJ$  is a right-angled triangle.

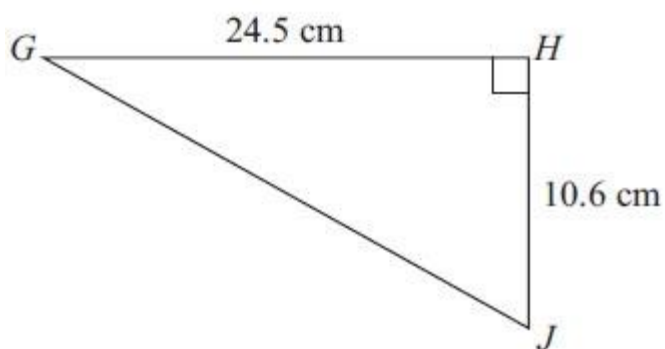


Diagram **NOT**  
accurately drawn

- (a) Calculate the length of  $GJ$ .  
Give your answer correct to one decimal place.

.....

(3)

$LMN$  is a different right-angled triangle.

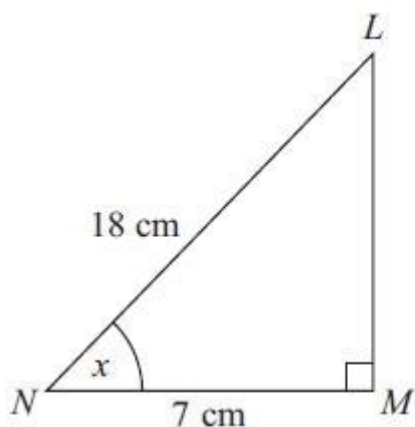


Diagram **NOT**  
accurately drawn

- (b) Calculate the size of the angle marked  $x$ .  
Give your answer correct to one decimal place.

.....

(3)

**(Total for Question is 6 marks)**