

GCSE Mathematics

Non Calculator

Foundation Tier

Mock 1, paper 1

ANSWERS



1 hour 45 minutes

Legend used in answers

Blue dotted boxes – instructions or key points

Start with a column or row that has only one number missing

Green Box - Working out

5b means five times b
 $b = -3$ so $5 \times -3 = -15$

Red Box and ✓ - Answer

48 % ✓ 24

Marks shown in brackets for each question (2)

Authors Note

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1. a) Write down the number seven hundred and twenty nine in figures.

729

(1)

- b) Write down the number 1493 to the nearest hundred.

1500

(1)

- c) Work out

Do 3×4 first

$$2 + 3 \times 4 - 1$$

13

(1)

2. 44 pupils were on the school bus.

28 got off at the first stop and 9 got off at the second stop.

How many pupils were left on the bus

$$44 - 28 - 9 = 7$$

(2)

3. In class 9Y, 50% of pupils stayed school dinners.

What is 50% as a decimal and a fraction

0.5 and $\frac{1}{2}$

(2)

In another class 9X, with 28 pupils, 75% stayed school dinner.

How many pupils stayed school dinner in this class.

$$\begin{aligned} 75\% &= \frac{3}{4} \\ \frac{3}{4} \text{ of } 28 &= 21 \end{aligned}$$

(1)

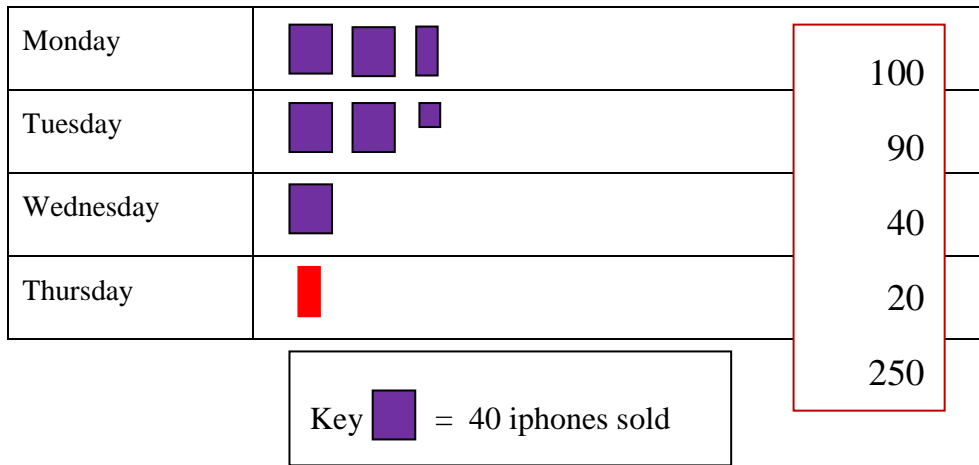
In another class 9Z, with 24 pupils 75% had packed lunch.

How many pupils did NOT have packed lunch in this class.

$$\begin{aligned} 25\% \text{ did not} &= \frac{1}{4} \\ \frac{1}{4} \text{ of } 24 &= 6 \end{aligned}$$

(1)

4. Look at the pictogram.
It shows how many iphones were sold in a shop during some weekdays.



- a) How many iphones were sold on Tuesday

$$2 \text{ lots of } 40 + \frac{1}{4} \text{ of } 40 = 90$$

(1)

On Thursday 20 iphones were sold.

- b) Complete the histogram with this information

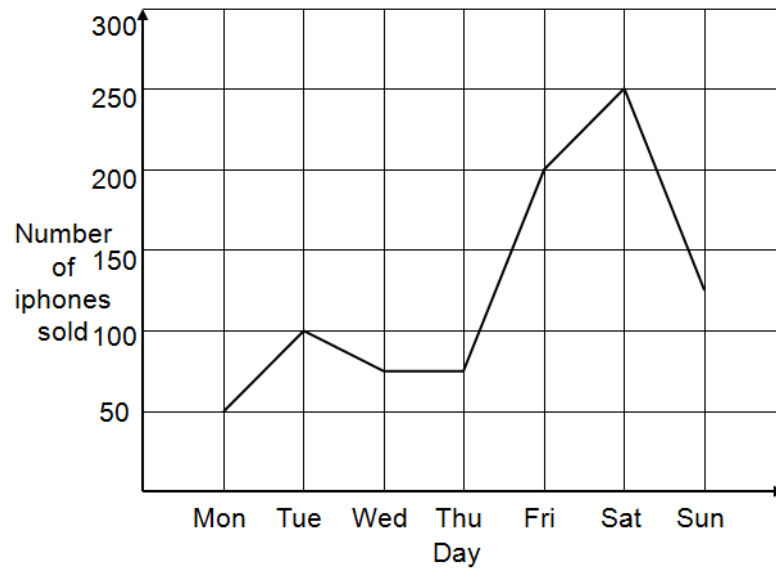
(1)

- c) How many iphones were sold in total on these four days

250

(2)

5. Look at the graph
It shows how many iphones were sold in a big department store during the week.



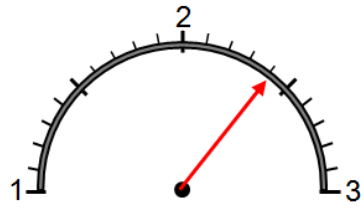
- a) On which days were the same number of iphones sold
..... Wednesday and Thursday (1)
- b) What was the maximum number of iphones sold in one day
250 .. iphones (1)
- c) What was the range of the number of iphones sold during the week.
 $250 - 50 = 200$.. iphones (2)

6. Here are the first 5 terms of a number pattern:

3 7 11 15 19

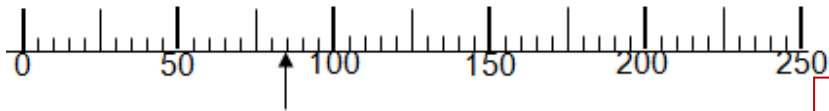
- a) What is the next term
Goes up in 4's so 23 (1)
- b) What is the 8th term
31 (1)

7. Read the value on each of these scales:



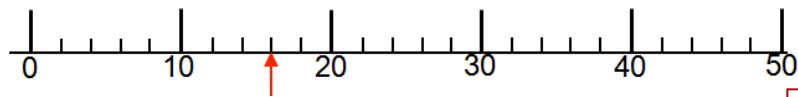
2.4

(1)



85

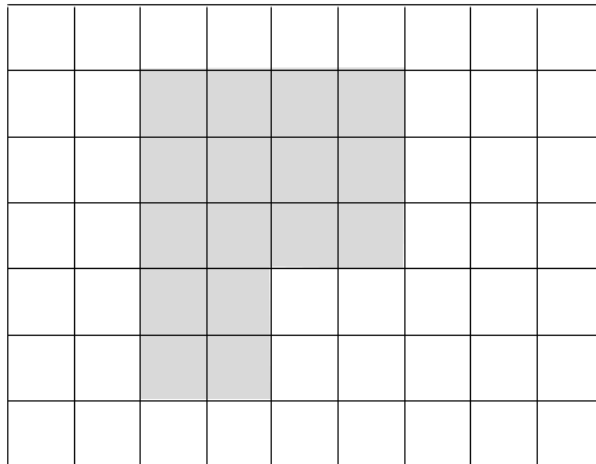
(1)



16

(1)

8. A shaded area is shown below on a centimetre grid



a) Work out the fraction of this shape that is shaded.

16/63

(1)

b) Work out the area of the shape

16

(1)

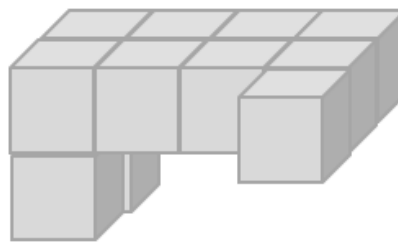
b) Work out the perimeter of the shape

18

(1)

Look at this shape, made from centimetre cubes.

c) What is the volume of this shape

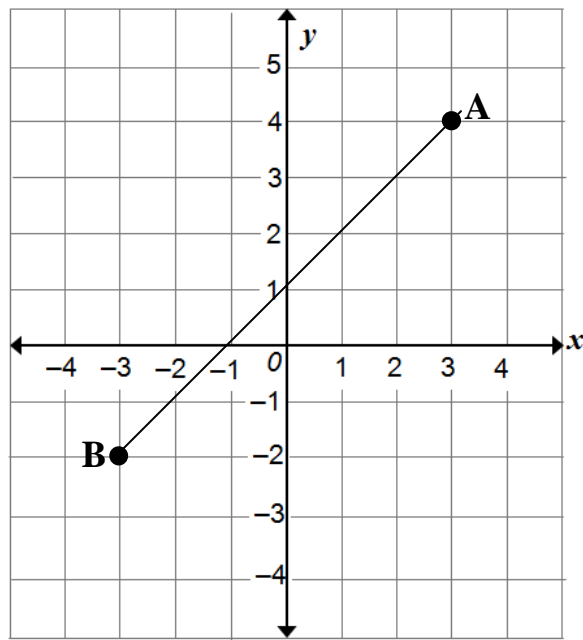


11

.....cm²

(2)

9.



a) Write down the co-ordinates of point

i) A

(3 , 4)

(1)

ii) B

(- 3 , - 2)

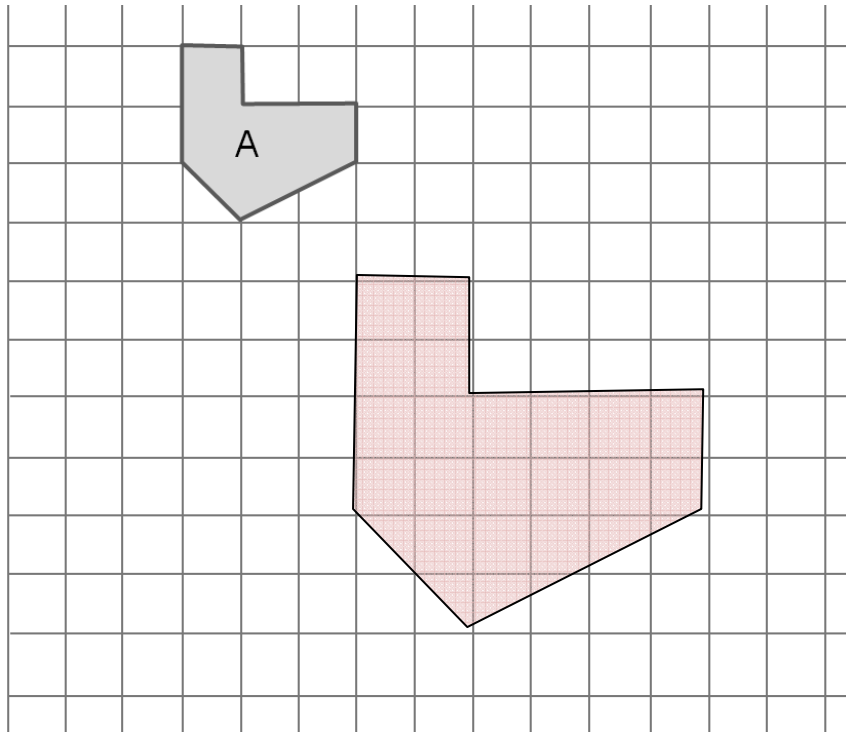
(1)

b) Write down the co-ordinates of midpoint of the line AB

(0 , 1)

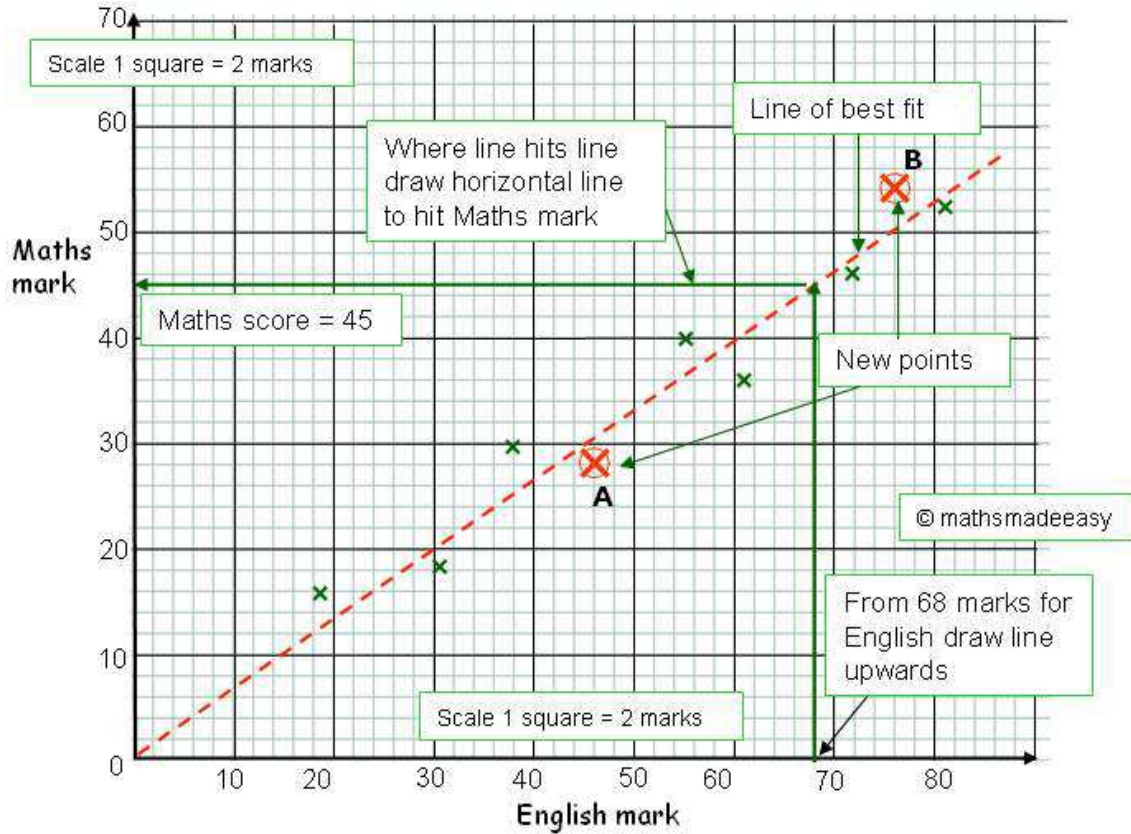
(1)

10. On the grid enlarge the shape A with a scale factor of 2



(2)

11.



a) What was the **median** marks for maths?

36

(1)

The table shows the marks on Maths and English for two more students, A and B.

	Student A	Student B
Maths	28	54
English	46	76

b) On the scatter graph, plot this extra information.

(1)

c) Draw a **line of best fit** on the scatter graph.

Leave an equal number of points on each side of the line

(1)

Luke's English mark was 68.

d) Using your line of best fit, estimate Luke's Maths mark

45 ± 1

From 68 on the x scale draw a line upwards until it hits the line of best fit
Then draw a line to the left to hit the y axis for the Maths mark

12. a) Harry thinks of the number **15**

For each question below, tick (✓) Yes or No for Harry's number.



15 is odd because we can half it into equal halves

	Yes	No
Is it an Odd number?	✓	
Is it a multiple of 3 ?	✓	
Is it a factor of 30 ?	✓	

15 is a multiple of 3 because it is in the 3 times table

15 is a factor of 30 because it goes into 30

(1)

12b. Josephina thinks of a number **between 2 and 20**

The table shows information about his number.

	Yes	No
Is it an even number?		✓
Is it a multiple of 5 ?		✓
Is it a prime number?		✓

What is her number?



Make a table of the numbers.
You want the number with no ticks

Number 1-20	even	Multiple 5	prime number
2	✓		✓
3			✓
4	✓		
5		✓	✓
6	✓		
7			✓
8	✓		
9			
10	✓	✓	
11			✓
12	✓		
13			✓
14	✓		
15		✓	
16	✓		
17			✓
18	✓		
19			✓
20	✓	✓	

This number is OK

9

(2)

13. A coach travels from Grimsby to Lincoln.

It leaves Grimsby at 12.55 and arrives in Lincoln at 14.15

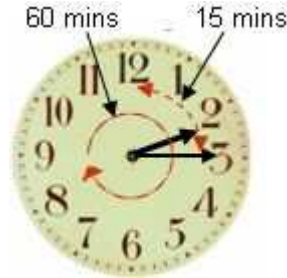
a) Work out how long the journey takes in *minutes*.

(2)

b) Work out how long the journey takes in *minutes*.



12.55 is five to one
There are 5 minutes to
one o'clock



From one to two o'clock
is another 60 minutes.
Finally add 15 minutes

Total journey time is
5 mins + 60 mins + 15 mins

80
..... minutes

There are 40 people on the coach at Grimsby
 $\frac{1}{10}$ of these are children

c) What is $\frac{1}{10}$ of 40

$\frac{1}{10}$ is like dividing by 10
Move the decimal point 1 place to the left

4 children

$\frac{1}{5}$ th of these 40 people are men

8 men

The rest of the 40 people are women

d) How many women were on the coach

$40 - 12 = 28$

(3)

14.

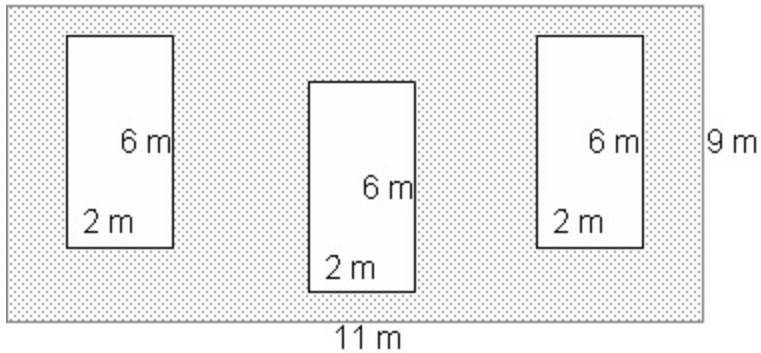


Diagram Not
drawn
accurately

The diagram above show three small rectangles inside a large rectangle.
The large rectangle is 11m by 9m.
Each of the smaller triangles is 6m by 2m.
Work out the area of the grey shaded region

The shaded area is the large rectangle area minus the areas of the three small rectangles

$$\text{Large rectangle AREA} = 11 \times 9 = 99 \text{ m}^2$$

$$\text{Small rectangle AREA} = 2 \times 6 = 12 \text{ m}^2$$

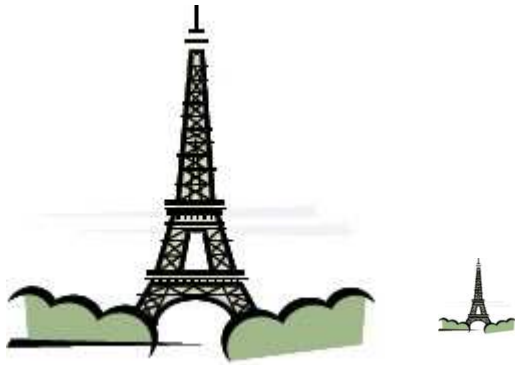
$$\text{Grey shaded Area} = 99 - 12 - 12 - 12 = 99 - 36 = 63 \text{ m}^2$$

63

..... m²

(3)

15.



Picture NOT drawn accurately

A model of the Eiffel tower is made to a scale of 0.5 centimetres to 1 metre.
The height of the Eiffel tower is 324 metres.

a) Work out the height of the model. Give your answer in centimetres

The Scale says 0.5cm on the model is 1m on the real tower.
So multiply the Eiffel tower (metres) by 0.5 to get answer in cm

$$0.5 \text{ is } \frac{1}{2}$$

$$324 \times \frac{1}{2} \text{ cm} = \frac{324}{2} = 162 \text{ cm}$$

.....cm
162 ✓

(2)

The width of the model at the base is 62 centimetres

b) Work out the width of the Eiffel Tower. Give your answer in metres

The scale says 0.5cm on the model is 1m on the real thing.
To go from 0.5 to 1 we MULTIPLY by 2 to get answer in metres

$$62 \times 2 = 124 \text{ m}$$

.....
124 ✓
.....m

(2)

16. Use the information that $347 \times 26 = 9022$ to find the value of

a) $3.47 \times 26 =$

Count how many places the decimal point has been moved and in which direction.

Move 2 places to the LEFT

No change

Overall move answer decimal point 2 places to Left

90.22

90.22

(1)

Top number point moves to left
 move answer point to Left
 Bottom number point moves to left
 move answer point to Right

b)
$$\begin{array}{r} 902.2 \\ \times 2.6 \\ \hline \end{array}$$

We know $\underline{9022}$ is 26
 347

Here we move one place to left so answer 26 becomes 2.6

Here we move two places to Left.
 The bottom number has the opposite effect on the answer so 2.6 becomes 260.0

260

(1)

17. Work out $\frac{3}{5} + \frac{2}{3}$

One way to find a new denominator is to multiply both old denominator together i.e. $5 \times 3 = 15$

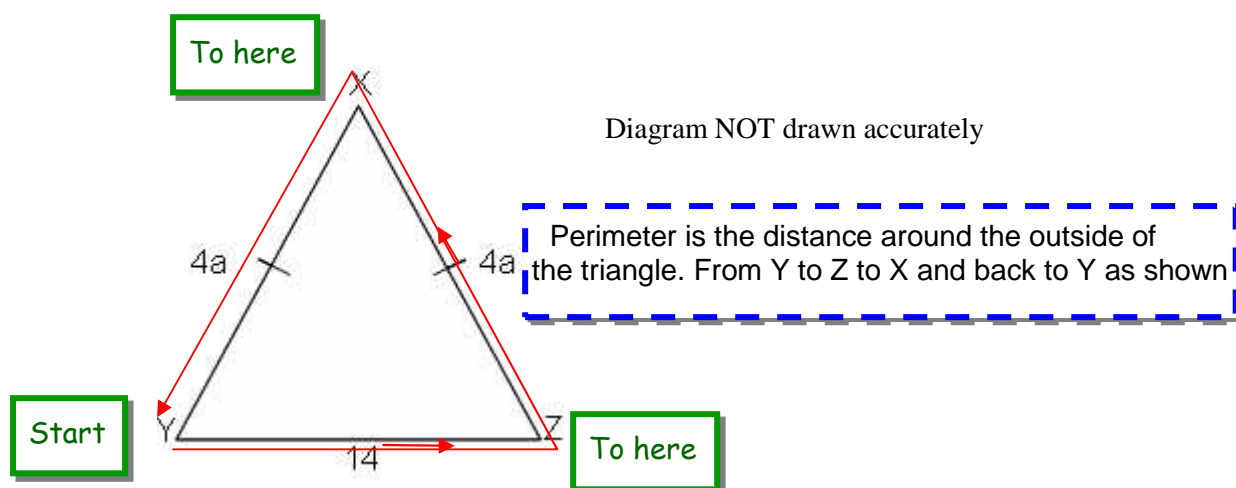
$$\frac{3}{5} + \frac{2}{3} = \frac{9}{15} + \frac{10}{15} = \frac{19}{15}$$

The numbers at the top must also be changed. Cross multiply to get the new numbers.

19/15 or 1 ⁴/₁₅

(2)

18.



In the diagram, above shows an isosceles triangle XYZ with measurements in centimetres.

$$\begin{aligned} XY &= 4a \\ XZ &= 4a \\ YZ &= 14 \end{aligned}$$

a) Find an expression in terms of a , for the **Perimeter** of the triangle in its simplest form

$$\text{Perimeter} = YZ + ZX + XY$$

$$YZ + ZX + XY = 4a + 4a + 14 = 8a + 14$$

$$\text{Simplify } 4a + 4a + 14 = 8a + 14$$

$$8a + 14$$

(2)

The perimeter of the triangle is 54 cm

b) Find the value of a

Make an equation with 54 and your previous answer

$$\text{Perimeter} = 8a + 14 = 54$$

Get rid of 14 on left by **subtracting 14** from both sides

$$8a + 14 - 14 = 54 - 14. \text{ So } 8a = 40$$

Divide sides by 8

$$\text{So } \frac{8a}{8} = \frac{40}{8} \quad \text{so } a = 5$$

$$a = 5$$

(2)

19. Henry stopped at the half-way cafe for lunch with his sister Poppy.

They ordered one Tea, one coffee, one Ham and Chips, one baked potato, one Apple Pie and one ice-cream..

The *half way Cafe* had a special offer : Orders over £10, get 10% off.

<i>Half-Way Cafe</i>		
Tea	£0.85	Juice...£0.50
Coffee	£1.10	
Cappuccino	£1.20	
MAINS		PUDDINGS
Bacon and eggs..	£3.18	Ice-cream...£1.50
Baked potato	£2.95	Apple Pie...£1.45
Ham and Chips ..	£3.05	Trifle
		£1.65

How much did they pay?

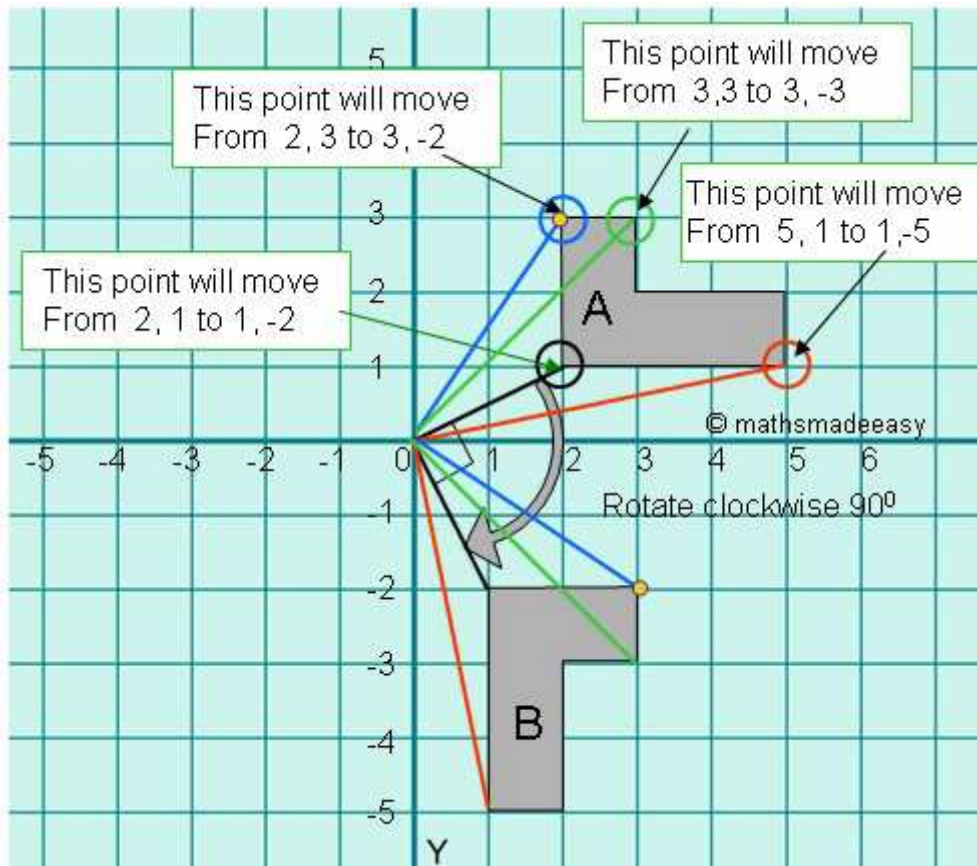
0.85	10% off = 1.09
1.10	
3.05	10.90
2.95	1.09 -
1.45	£9.89
1.50 +	
10.90	

£9.89

(3)

20. On the grid below rotate the shaded shape A by 90° clockwise about the origin 0. Label the new shape B

(3)



21. The table below show several rows of a number pattern

Row 1	$1^2 - 0^2 = 1 = 1 + 0$
Row 2	$2^2 - 1^2 = 3 = 2 + 1$
Row 3	$3^2 - 2^2 = 5 = 3 + 2$
Row 4	$4^2 - 3^2 = 7 = 4 + 3$
Row 5	$5^2 - 4^2 = 9 = 5 + 4$

- a) Complete row 5 of the number pattern

The number in the row is:

$$\text{Row number}^2 - (\text{row number} - 1)^2 = 2 \text{ row number} - 1$$

(1)

$$\text{So Row 5 is } 5^2 - (5-1)^2 = 2 \times 5 - 1$$

or $5^2 - 4^2 = 9$

$$\text{Row 6 is } 6^2 - (6-1)^2 = 2 \times 6 - 1$$

or $6^2 - 5^2 = 6 + 5 = 11$

- b) Use the number pattern to find the answer to $120^2 - 119^2$

We can see that the answers for each row are:

row number + (row number + 1) e.g. row 4 = 4 + 3, row 5 = 5 + 4

239

So the answer to $120^2 - 119^2$ will be in row 120
 Row 120 = $2 \times 120 - 1 = 239$

(2)

22.

a) Simplify $3x + 4y - x - 2y$

$$2x + 2y$$

(2)

b) Simplify $4y^2 - 3y^2$

$$3y^2$$

(1)

c) Expand $3(y^2 - 3y)$

$$3y^2 - 9y$$

(1)

d) Solve $6z + 4 = 22$

$$6z + 4 = 22$$

Take 4 from both sides

$$z = \dots\dots\dots \boxed{3}$$

(2)

$$6z + 4 - 4 = 22 - 4 \quad \rightarrow \quad 6z = 18$$

Divide sides by 6
So $\frac{6z}{6} = \frac{18}{6}$

Cancelling
 $\frac{\cancel{6}z}{\cancel{6}} = \frac{18}{\cancel{6}}$

e) Solve $6a + 2 = 4a + 9$

To get rid of 2, take 2 from each side

Move the a terms to one side of the equation and numbers to the other. Do this by adding or subtracting terms

$$6a + 2 - 2 = 4a + 9 - 2$$

$$a = \dots\dots\dots \boxed{\frac{7}{2}}$$

$$6a = 4a + 7$$

To get rid of 4a, Take 4a from both sides

$$6a - 4a = 4a + 7 - 4a$$

$$2a = 7$$

$$\frac{2a}{2} = \frac{7}{2}$$

(2)

f) $A = 5b + 2c$

$b = -3$
 $c = 6$

Work out the value of A

5b means five times b
 $b = -3$ so $5 \times -3 = -15$

Use the values given in place of the letters

2c means two times c
 $c = 6$ so $2 \times 6 = 12$

Add these values together
 $12 - 15 = -3$

$$A = \dots\dots\dots \boxed{-3}$$

(2)

23. Express 144 as a product of its prime factors

Make a Prime factor **TREE** - put your number at the top and constantly divide by prime numbers as shown.

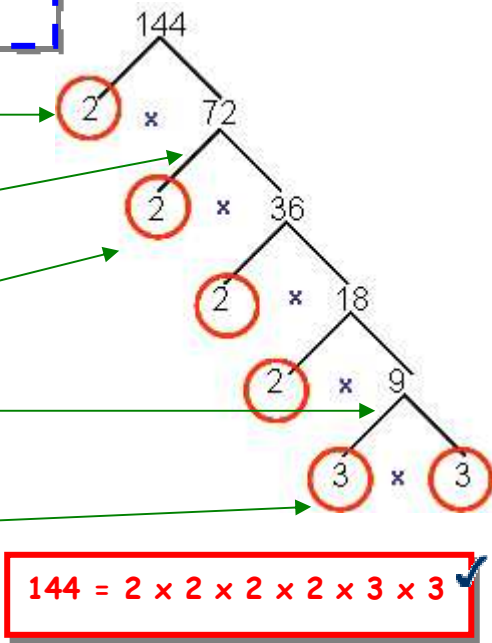
The first prime numbers to try is 2

$$144 \div 2 = 72$$

72 also divides by 2

9 won't divide by 2 so try next prime, 3

Prime numbers at the end so we have finished
Multiply all the prime numbers **circled**



(3)

24. David did a survey of the time in hours, people spent watching TV in a week. He recorded his results in the following table.

Time (t hours)	Frequency
$0 < t \leq 5$	10
$5 < t \leq 10$	13
$10 < t \leq 15$	16
$15 < t \leq 20$	12
$20 < t \leq 25$	9

- a) Write down the Modal Class Interval

$$10 < t \leq 15$$

(1)

A person is selected at random from David's survey

$15 < t \leq 20$	12
$20 < t \leq 25$	9

All these people watched > 15 hours of TV = $12 + 9 = 21$

Total number people in survey is $10 + 13 + 16 + 12 + 9 = 60$

Probability > 15 hrs TV = $\frac{\text{number people watching } > 15 \text{ hrs TV}}{\text{Total people watching}}$

$$\text{Probability } > 15 \text{ hrs TV} = \frac{21}{60}$$

$$P(>15\text{hrs}) = \frac{21}{60}$$

(2)

25. a) Complete the table of values for $y = x^2 - x - 2$ below

x	-3	-2	-1	0	1	2	3
y	10	4	0	-2	-2	0	4

$$(-2) \times (-2) - (-2) - 2 = +4 + 2 - 2 = 4$$

$$(0) \times (0) - (0) - 2 = -2$$

$$(2) \times (2) - (2) - 2 = 0$$

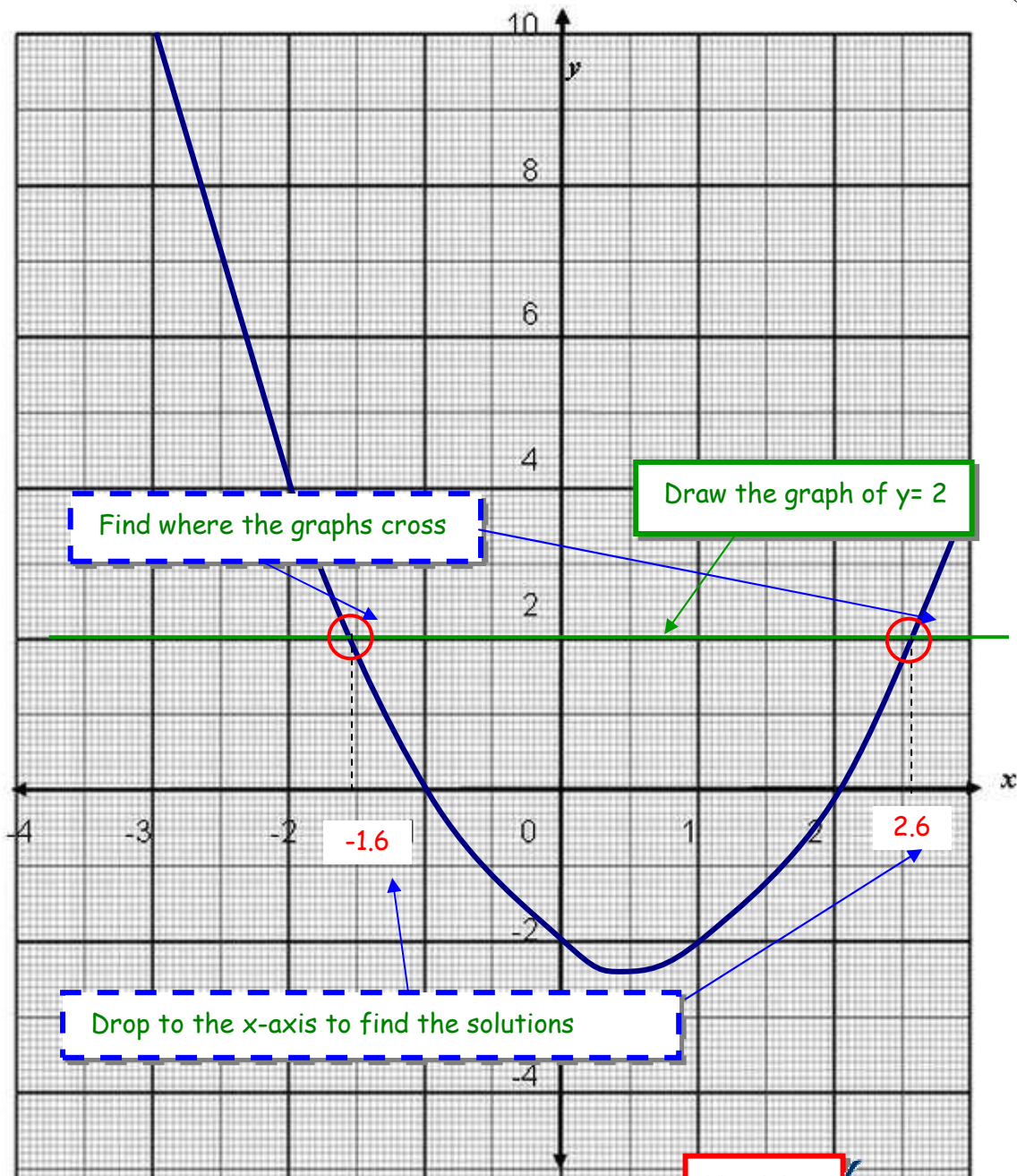
x	x^2	$-x$	-2	y
-2	4	+2	-2	4
0	0	0	-2	-2
2	4	-2	-2	0

Use a table to work out y.
Don't forget $-x = +$

(2)

b) Draw the graph for $y = x^2 - x - 2$ on the grid below

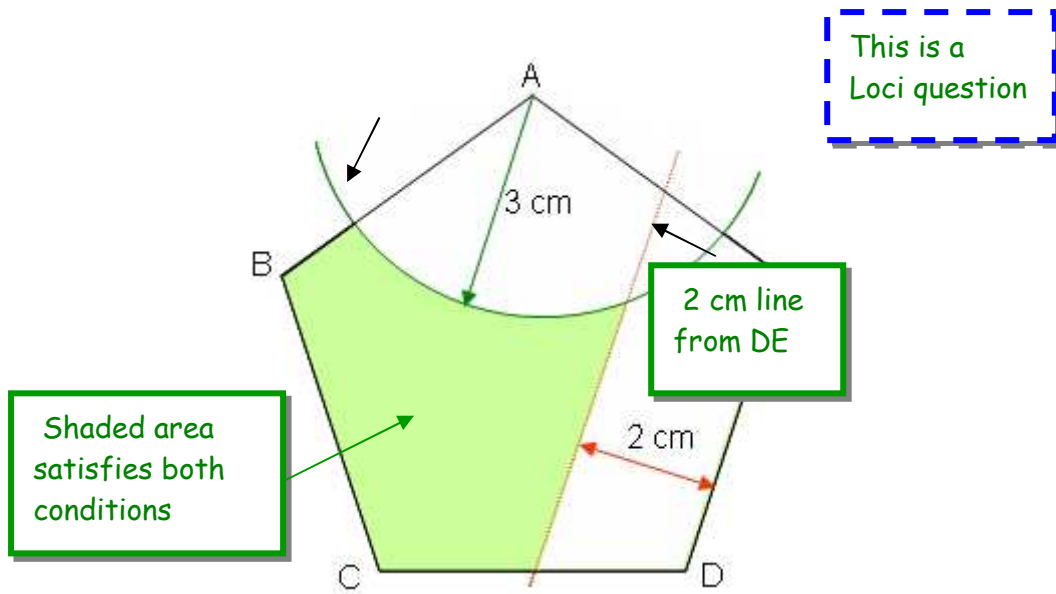
(2)



X = -1.6
X = 2.6

c) Use your graph to estimate the values of x when $y = 2$ $x = \dots\dots\dots$ $x = \dots\dots\dots$ (2)

26.



ABCDE is a pentagon
Shade the area inside the pentagon which is both

more than 3 centimetres from A **and**
more than 2 centimetres from the line DE

(4)

27. Laura wanted to know how much time students spent watching TV programs. She used the question below on her questionnaire.

“How much TV did you watch this week?”

Not much

Quite a lot

a) What two things are wrong with this question?

We don't know over what time period it is ✓

The options are too vague ✓

(2)

b) Design a better question that Laura can use to find out how much time students spend watching TV programs. Include some response boxes.

How much time have you spent watching TV this week? ✓

Make the options specific: ✓

II	IIII	IIII III	IIII	II
None	1-5 hours	6-10 hours	11-15 hours	More than 15 hours

(2)

28. Estimate the following:

Estimate by rounding the numbers

$$\frac{809 \times 1.912}{0.395}$$

809 is about 800;
1.912 is about 2
0.395 is about 0.4

CANCEL to make it easier

$$\frac{800 \times 2}{0.4}$$

$$\frac{800 \times \cancel{2}^1}{\cancel{0.4}^{0.2}}$$

$$\frac{\cancel{800}^{400} \times 1}{\cancel{0.2}^{0.1}}$$

$$\frac{400}{0.1} = 4000$$

(2)