

GCSE Mathematics  
 Non Calculator  
 Foundation Tier  
 Free Practice Set 5  
 1 hour 30 minutes



**ANSWERS**

Marks shown in brackets for each question (2)

Typical Grade Boundaries

C	D	E	F	G
76	60	47	33	20

**Legend used in answers**

**Green** Box - Working out

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

**Red** Box and ✓ - Answer

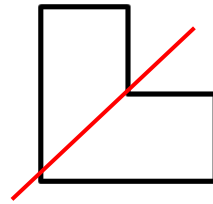
48 % ✓

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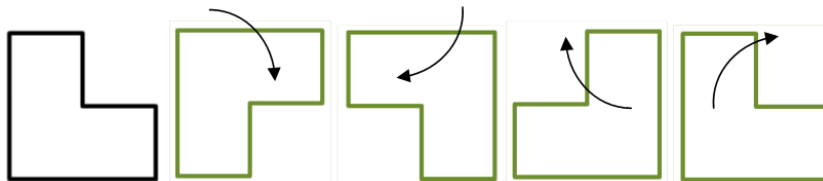
1. a) Draw a line of symmetry on the shape below.



A line of symmetry has the same image on both sides of the line

(1)

- b) What is the order of rotational symmetry for this shape



It only looks the same once for a full rotation

1

(1)

2. The space shuttle travels at 27 870 km per hour

- a) What is 27 870 in words.

**Twenty seven thousand eight hundred and seventy**

(1)

- b) What is 27 870 to the nearest hundred.

The hundreds part of the number, 870 is closer to 900 than 800

**27, 900**

(1)

- c) If the space shuttle travelled for 3 hours how far would it have travelled

It travels 27, 870 in 1 hour so it travels  $3 \times 27, 870$  in 3 hours

**$27\ 870 \times 3 = 83\ 610$**

. km

(2)

- d) The wingspan of the space shuttle is 23.79 m  
What is the wingspan in cm.

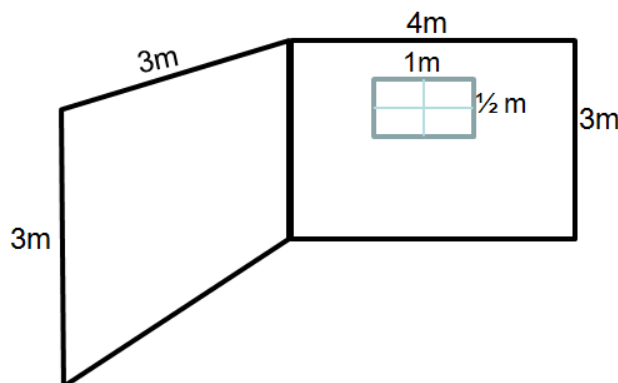
1m = 100cm so times by 100

**$23.79 \times 100 = 2379$**

.cm

(1)

3. Two walls of a bathroom need tiling. The walls are shown below.



not drawn accurately

One wall is 3 metres by 3 metres.

The other wall is 3 metres by 4 metres with a window which is 1 metre by  $\frac{1}{2}$  metre.

Work out the area that needs tiling.

$$\begin{aligned} \text{Side wall: } 3 \times 3 &= 9\text{m}^2 & \text{back wall: } 4 \times 3 &= 12\text{m}^2 & \text{window} &= 1 \times \frac{1}{2} = \frac{1}{2} \text{m}^2 \\ \text{Total area} &= 9 + 12 - \frac{1}{2} &= 20\frac{1}{2} \text{m}^2 \end{aligned}$$

**20  $\frac{1}{2}$**

. m<sup>2</sup>

(3)

Tiles are squares measuring 25cm by 25 cm. They cost £3.00 each  
Calculate the costs of tiling the bathroom

$$\begin{aligned} \text{Tiling area} &= 9 + 12 - \frac{1}{2} = 20\frac{1}{2} \text{m}^2 \\ \text{Each tile is } \frac{1}{4} \times \frac{1}{4} &= \frac{1}{16} \text{m}^2 \\ \text{How many } \frac{1}{16} &\text{ go into } 20\frac{1}{2} = 320 + 8 = 328 \text{ tiles} \\ \text{Cost} &= £3 \times 328 = £984 \end{aligned}$$

**984**

£.....

(3)

4. A number pattern is shown below.

Pattern number	Pattern	Total
1	3 =	3
2	3 + 4 =	7
3	3 + 4 + 4 =	11
4	<b>3+4+4+4 =</b>	<b>15</b> ✓
5	<b>3+4+4+4+4=</b>	<b>19</b> ✓

a) Complete the table above.

(2)

b) What is the expression in terms of  $n$ , for the total in pattern number  $n$ .

The pattern goes up by 4 each time so part of the expression is  $4n$   
 We have to subtract 1 from each term to get our pattern

**$4n - 1$**  ✓

(2)

5. a) Matthew was paid £1234 a month. His rent was £357 a month  
 How much did he have left after paying his rent.

$1234 - 357 = 877$

**877** ✓

(1)

What is

b)  $-5.3 - 4.7$

Like  $5.3 + 4.7$ , but change sign to minus

**-10** ✓

(1)

c)  $4 + 5 \times 2$

Do  $5 \times 2$  first then add 4

**14** ✓

(1)

d) Arrange these numbers from *smallest to largest*.

0.809      - 1.09      0.099      - 0.9      0.89

**- 1.09, - 0.9, 0.099, 0.809, 0.89** ✓

(1)






6. The tally chart shows how many pies Henry sold in his cafe in a week.

	Tally	Frequency
Monday		5
Tuesday		$5+2 = 7$
Wednesday		10
Thursday		12
Friday		11
Saturday		$5+5+5+2 = 17$

- a) Complete the tally and frequency columns.

(2)

The pictogram shows the same information above.

	Pies sold
Monday	○ 
Tuesday	○ 
Wednesday	○ ○ 
Thursday	○ ○ ○
Friday	○ ○ 
Saturday	○ ○ ○ ○ 

Key:	○ = 4
------	-------

- b) Complete the pictogram and the key.

(2)

7. a) Estimate:

$$12.9 \times 199$$

Show your working.

$$12.9 \rightarrow 13 \text{ and } 199 \rightarrow 200$$

13 x 200 is like doing 13 x 2 then adding two zeros

2600

(1)

b) Estimate:

$$\frac{24.9 \times 50.1}{10.2 \times 4.9}$$

Top is  $\frac{25 \times 50}{10 \times 5} = \frac{25 \times 50}{50} = 25$   
Bottom is

25

(2)

8. a) What is **1500** grams in kilograms.

1000 g = 1 kg so divide by 1000

Move the decimal point left by 3 places

1.5

.. kilograms

(1)

b) What is **1.234** kilometres in metres.

1 km = 1000 m so multiply by 1000

Move the decimal point right by 3 places

1234

.. metres

(1)

c) What is **0.225 litres** in millilitres

1 litre = 1000 ml so multiply by 1000

Move the decimal point right by 3 places  
Add a zero if needed

225

millilitres

(1)

9. Henry drove 155 miles from Bedworth to Yarm.  
He stopped at the “*half way cafe*” for a meal and a drink.  
The cafe is *exactly half the distance* between Bedworth and Yarm.

Using 5 miles = 8 kilometres what is

- a) The distance from Bedworth to the *half-way cafe* in kilometres.

The km value is larger than the miles value so divide by 5 then multiply by 8

155 divided by 5 = 31 then  $31 \times 8 = 248$

The half way cafe is half the distance, so it's 124 km

124

km (3)

- b) At the *half way Cafe* they had a special offer:

**Special offer**  
**1 drink, 1 main, 1 pudding for only £5.00**

Henry ordered one Tea, Ham and Chips and Apple Pie.  
He paid the special offer price of £5.00

How much did he *save* compared to the normal price?

<i>Half-Way Cafe</i>		
Tea .....	£0.85	Juice...£0.50
Coffee .....	£1.10	
Cappuccino .....	£1.20	
<b>MAINS</b>		<b>PUDDINGS</b>
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

Tea	£0.85
Ham & Chips	£3.05
Apple Pie	£1.45
Total	£5.35

£. 0.35 (3)

10. Chantelle wants to buy *two pairs* of trainers.  
Three shops sell the trainers she wants, as shown below.

<p><b>DW Shoes</b></p> <p>Trainers</p> <p>Normal price £40</p> <p><math>\frac{1}{5}</math> th off</p>	<p><b>JC Sports</b></p> <p>Trainers</p> <p>Normal price £38</p> <p>15% off</p>	<p><b>Joggers</b></p> <p>Trainers</p> <p>Normal price £43</p> <p>Buy one pair get 2<sup>nd</sup> pair Half price</p>
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Calculate which shop is the cheapest for *two pairs* of trainers.  
Show all your working

<p>DW</p> <p><math>\frac{1}{5}</math><sup>th</sup> of £40 = £8</p> <p>So 1 pair costs £40 – £8 = £32</p> <p>Two pairs cost <b>£64</b></p>	<p>JC</p> <p>10% of £38 = £3.80 5% of £38 = £1.90 £5.70</p> <p>So 1 pair costs £38 – £5.70 = £32.30</p> <p>Two pairs cost <b>£64.60</b></p>	<p>Joggers</p> <p>1<sup>st</sup> pair costs £43</p> <p>Half of £43 is £21.50</p> <p>Two pairs cost <b>£64.50</b></p>
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Cheapest Shop is.....

**DW shoes is cheapest –  
two pairs of trainers cost £64**

(5)



11. a) What is 28% as a *fraction*.  
Give your answer in its simplest form.

$$\frac{28}{100} = \frac{14}{50} = \frac{7}{25}$$

Halve numbers each time

$$\frac{7}{25}$$

(1)

- b) In a group of 50 pupils, 21 were girls.  
What *percentage* of the class were **boys**.

$$\frac{21}{50} \rightarrow \frac{42}{100}$$

Double numbers

42% are girls  
So 58% are boys

$$58\%$$

(1)

- c) Work out

$$\frac{1}{2} \times \frac{1}{3}$$

Multiply top numbers → 1  
Multiply bottom numbers → 6

$$\frac{1}{6}$$

(1)

- d) Work out

$$\frac{2}{3} + \frac{1}{6}$$

Change  $\frac{2}{3}$  to  $\frac{4}{6}$  then add to  $\frac{1}{6}$

$$\frac{5}{6}$$

(2)

12. David is  $y$  years old.

His wife Jane is 3 years younger.

a) Write down an expression, in terms of  $y$ , for Jane's age.

David =  $y$  years; Jane =  $y - 3$  years

$y - 3$

(1)

The total age of both David and Jane is 117 years.

b) Write an equation and solve it to find the value of  $y$  (David's age).

$$\begin{aligned}y + y - 3 &= 117 \\2y - 3 &= 117 \\ \text{Add 3 to both sides} & \\2y &= 120 \\y &= 60\end{aligned}$$

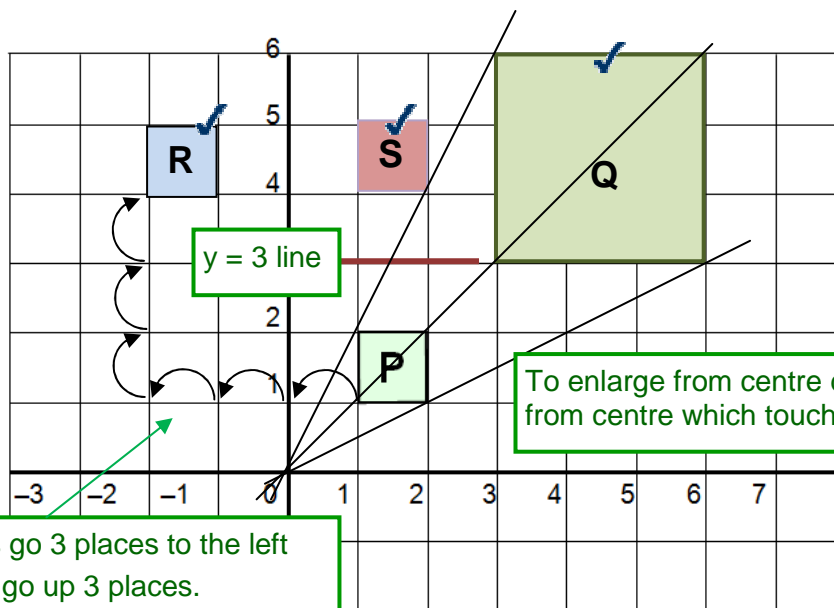
60

.years

(2)

13. A square P is shown on the grid below.

a) Enlarge P by scale factor 3, with centre O. Label the new shape Q.



(3)

b) Translate square P by  $\begin{bmatrix} -3 \\ +3 \end{bmatrix}$  Label the new shape R

(1)

c) Reflect shape P in the line  $y = 3$ . Label the new shape S

(2)

14. A teacher recorded the test marks out of 50 for 19 students in her class.

34    31    29    17    16    25    45    21    17    33  
 40    24    32    29    44    17    21    33    29

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

Order numbers in sequence or tick them off as you enter them into stem and leaf

<b>1</b>	<b>6 7 7 7</b>
<b>2</b>	<b>1 1 4 5 9 9 9</b>
<b>3</b>	<b>1 2 3 3 4</b>
<b>4</b>	<b>0 4 5</b>

Key **2 | 7 = 27** ✓

(3)

b) What was median mark

Median = middle mark = 9<sup>th</sup> one

**29**

 ✓

(1)

c) What was the range of marks

Range = highest – lowest = 45 – 16

**29**

 ✓

(1)

15. Given that

$$543 \times 21 = 11403$$

find the value of

Decimal point moved 1 left

a)  $54.3 \times 2.1$

Decimal point moved 1 left

In answer move dp 2 left

**114.03**

 ✓

(1)

b)  $0.543 \times 0.21$

Decimal point moved 3 left

Decimal point moved 2 left

In answer move dp 5 left

**0.11403**

 ✓

(1)

c)  $1140.3 \div 543$

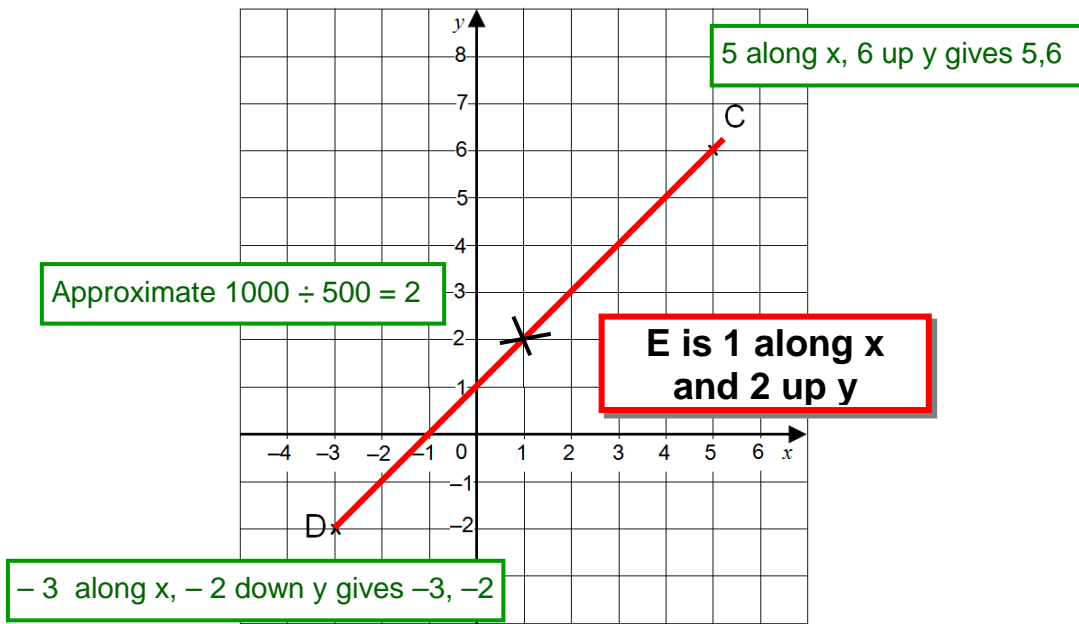
Approximate  $1000 \div 500 = 2$

**2.1**

 ✓

(1)

16. Look at the points shown on the graph.



a) Write down the coordinates of point C.

(... **5, 6** ...) (1)

b) Write down the coordinates of point D.

(... **- 3, - 2** ...) (1)

c) Draw a line between points C and D. Mark the mid-point of the line with a cross (×) and label it as E.  
Write down the co-ordinates of the point E.

Point E is (... **1, 2** ...) (1)

17.  $P = 6q - 3r$   
 $q = 7$   
 $r = -2$

Work out P

Remember  $- 1 \times - 1 =$

$$6 \times 7 - 3 \times - 2 = 42 + 6 = 48$$

If  $P = 24$  and  $r = 2$  work out q

$$24 = 6q - 3 \times 2 = 6q - 6$$

Add 6 to both sides  
So  $30 = 6q$

P = ..... **48** (2)

q = ..... **5** (2)

18. A regular shape has an angle marked  $y$  as shown.

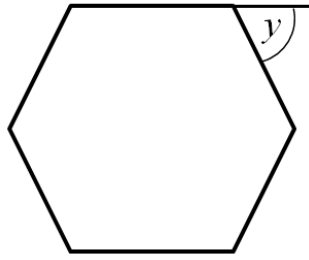


Diagram not drawn accurately

- a) Why is it called a *regular*

**All angles are the same and all sides equal length**

(1)

- b) Write down the name of the regular shape.

**Hexagon**

(1)

- c) Calculate the size of the external angle marked as  $y$ .  
Show all your working.

There are 6 external angles.  
All external angles add up to  $360^\circ$

$$360 \div 6 = 60$$

**60**

(2)

19. Josh measured three pieces of wood – Oak, Pine and Teak.  
Altogether they measured 63cm long.  
The Oak piece was twice as long as the Pine piece.  
The Teak piece was three times as long as the Oak piece.

How long was each piece of wood.

Say the pine piece is  $x$  long  
So the oak piece is  $2x$  long  
And the teak piece is  $6x$  long

All together length is  $x + 2x + 6x$  long =  $9x$   
This is 63 cm  
So  $9x = 63$  and  $x = 7$ cm

Pine ..

**7**

Oak ..

**14**

Teak ..

**42**

(3)

20. Self-employed people can claim expenses for car travel.  
Use the rule below to work out how much can be claimed for car travel

$$\text{Claim} = \text{£}0.45 \times \text{number of miles}$$

- a) Stuart travelled 220 miles  
How much can he claim for 220 miles.  
Give your answer in pounds and pence

Split 220 into 200 and 20 to make multiplication easier

$$\begin{aligned} 220 \times 0.45 \\ 200 \times 0.45 = \text{£}90 \\ 20 \times 0.45 = \text{£} 9 \end{aligned}$$

£ **99** (2)

- b) Laura claimed £141.75 for petrol.  
How many miles did she travel

Divide 141.75 by 0.45  
Or divide 14175 by 45 – see over

**315** (2)

Lay out your division like this

$$45 \overline{) 14175}$$

Will 45 go into 1 Or 14 ? -NO

$$45 \overline{) 14175}$$

Try the next three digits  
Will 45 go into 141? YES

$$45 \overline{) 14175}$$

How many times will 45 go into 141?  
Three times:  $3 \times 45 = 135$   
Put 3 at the top.

$$45 \overline{) 14175} \quad \begin{array}{c} 3 \\ \hline \end{array}$$

Is there a remainder  
YES :  $141 - 135 = 6$ .  
Put 6 before the 7

$$45 \overline{) 141^675} \quad \begin{array}{c} 3 \\ \hline \end{array}$$

Will 45 go into 67  
YES: once  
Put 1 at the top

$$45 \overline{) 141^675} \quad \begin{array}{c} 31 \\ \hline \end{array}$$

Is there a remainder  
Yes :  $67 - 45 = 22$   
Put 22 before the 5

$$45 \overline{) 141^67^{22}5} \quad \begin{array}{c} 31 \\ \hline \end{array}$$

Will 45 go into 225  
Yes 5 times  
Put 5 at top

$$45 \overline{) 141^67^{22}5} \quad \begin{array}{c} 315 \\ \hline \end{array}$$

Is there a remainder  
No - we have finished

21. The two way table shows information about 50 students and which sport they prefer.

	Boys	Girls	Total
Swimming	11	17	28
Gymnastics	3	5	8
Athletics	8	6	14
Total	22	28	50

(3)

- a) Complete the two-way table

One student is picked at random

- b) What is the probability that this student prefers swimming

28 students prefer swimming  
50 students in total

$$\frac{28}{50}$$

(1)

- c) A girl was picked. What is the probability she prefers gymnastics

5 girls prefer gymnastics  
28 girls in total

$$\frac{5}{28}$$

(1)



22.

a) Factorise:  $14a + 7$

7 is a factor of both so take outside brackets

$$7(2a + 1)$$

(1)

b) Expand  $y(y - 5)$

Multiply everything inside brackets by y outside

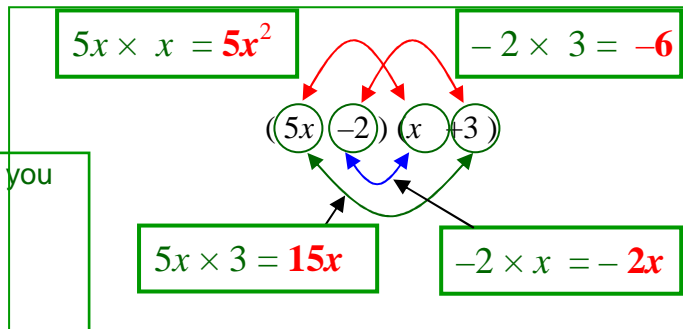
$$y^2 - 5y$$

(2)

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

Double Brackets mean FOUR multiplications

Use **FOIL** to help you remember the 4 multiplications:  
**F**irst terms  
**O**uter terms  
**I**nner terms  
**L**ast terms



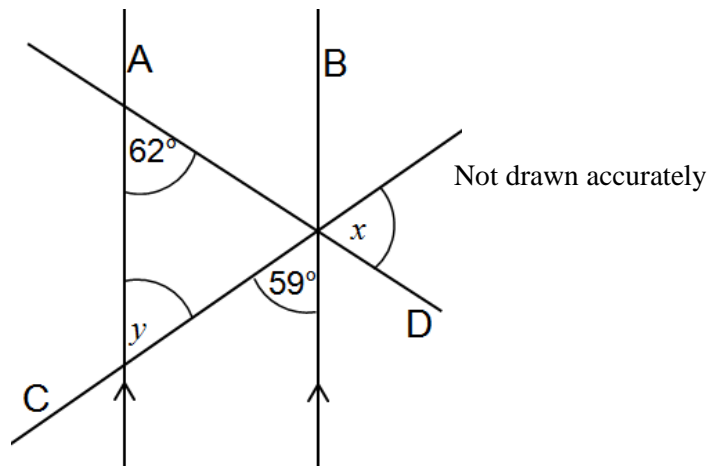
Simplify – collect like terms together

$$15x - 2x + 5x^2 - 6 = 5x^2 + 13x - 6$$

$$5x^2 + 13x - 6$$

(2)

23.



Line A is parallel to line B  
Two lines C and D diagonally cross lines A and B

a) What is the size of the angle marked  $y$

$y$  is an alternate angle in a Z shape

59°

(1)

b) What is the size of the angle marked  $x$

The angle opposite  $x$  in the triangle is  $180 - 62 - 59 = 59^\circ$ . So  $x$  is  $59^\circ$

59°

(1)

24. Bill had an internet business selling socks. He starts by charging £5.00 for each pair plus postage of £3 for each order.

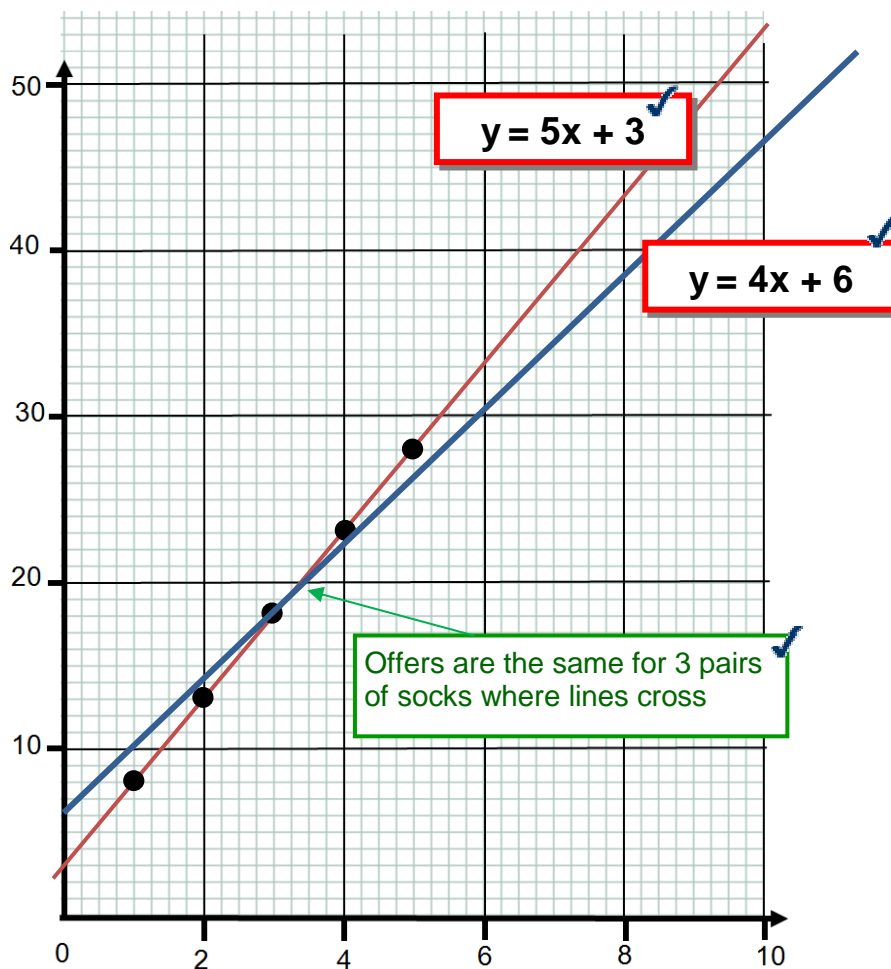
a) Complete the table below

Number of pairs of socks in an order	1	2	3	4	5
Total cost of order	£8	£13	£18	£23	£28

(2)

b) On the graph below for  $x = 0$  to 10, plot the equation

$$y = 5x + 3$$



(2)

- c) Bill reduced the price for a pair of socks to £4, but increased postage to £6. On the same graph plot the equation showing this information. Compare both offers and work out for how many pairs of socks they charge the same.

(2)

Equation is  $y = 4x + 6$  for new offer

Pick some values for  $x$  – the number of pairs of socks and work out  $y$  the cost.

**The two offers are the same for 3 pairs of socks**