Non-calculator paper

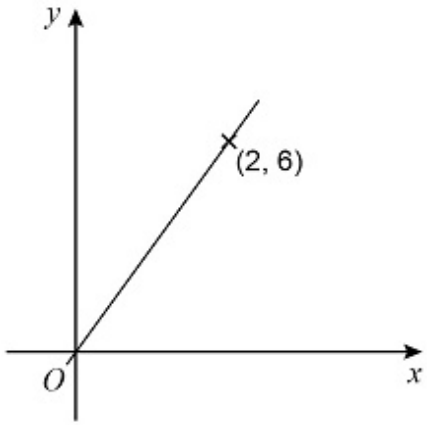
1) Write 36 as a product of prime factors.
Give your answer in index form.

2)Megan took two tests.
Here are her results.

Geography test $\frac{13}{20}$
History test $\frac{16}{25}$

In which test did Megan get the higher percentage mark?
You **must** show your working.

3) A straight line passes through *O* and (2, 6)



What is the equation of the line?

4) For a biased dice, P(6) = $\frac{3}{5}$
What is the probability of two sixes when the dice is rolled twice.

6) Expand and simplify fully $4(2c + 3) – (5c – 1)$

7) (a) Cards in a pack are red or blue in the ratio

red : blue = 2 : 3

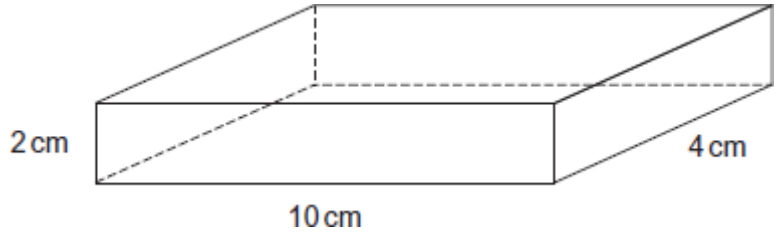
What fraction of the cards are **red**?

(1)

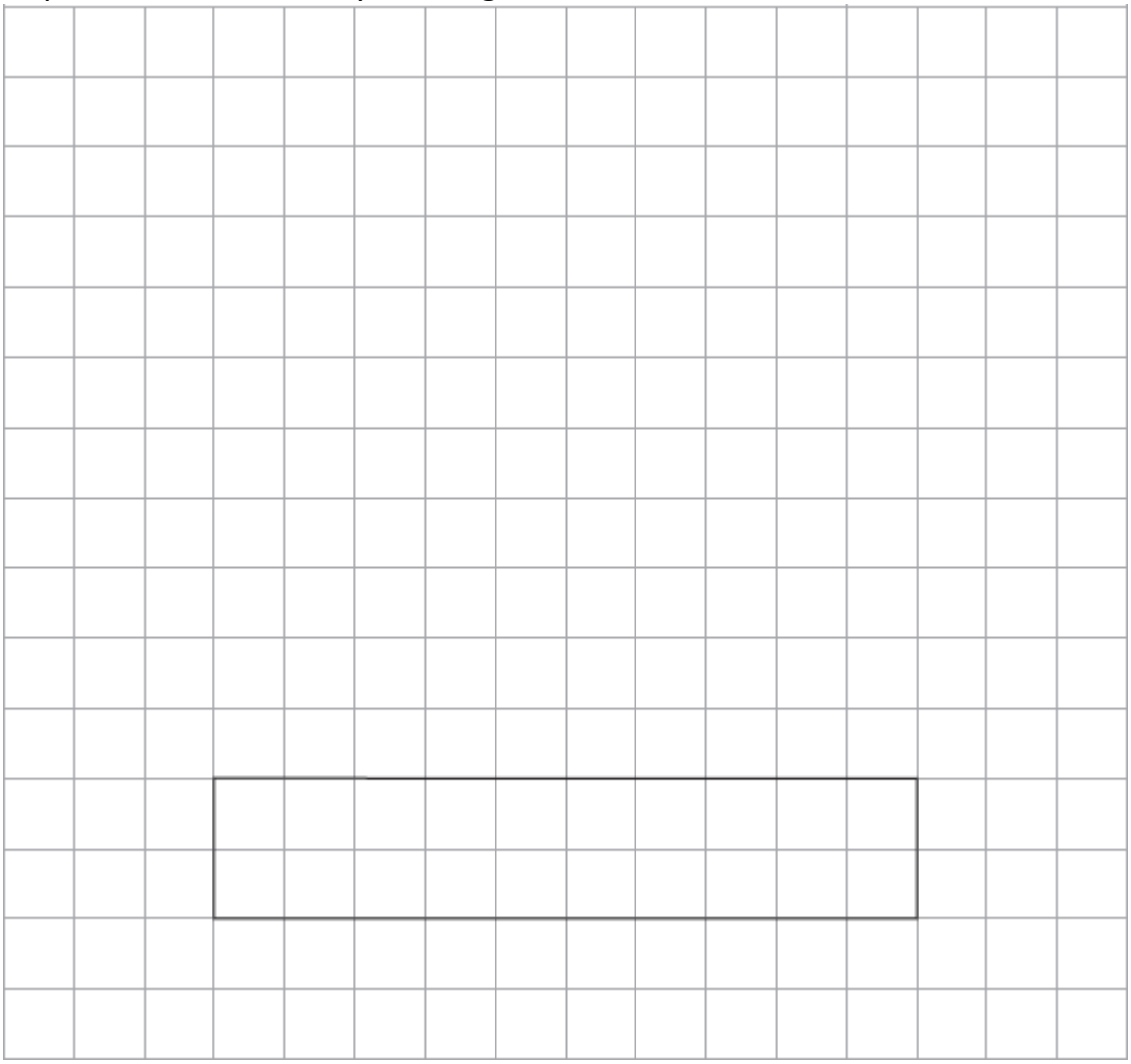
(b) A different pack has 72 cards.

$\frac{5}{9}$ are yellow. Work out the number of yellow cards. **(2)**

5) A tray for holding paper clips is an **open** cuboid.

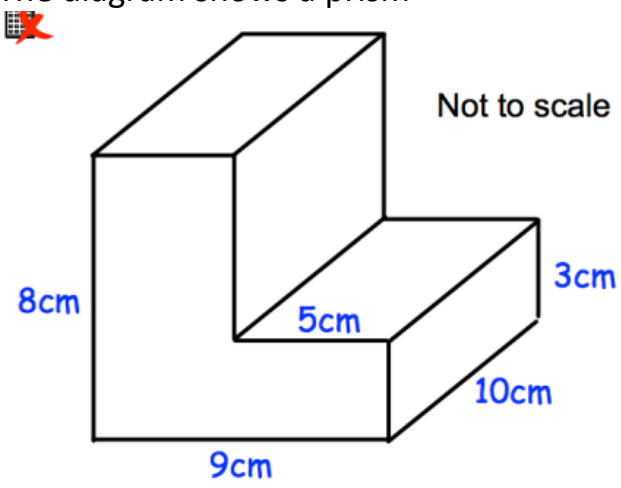


Complete a net for the tray on the grid.



10) What is the highest common factor (HCF) of $6xy^2$ and $4x^3y$

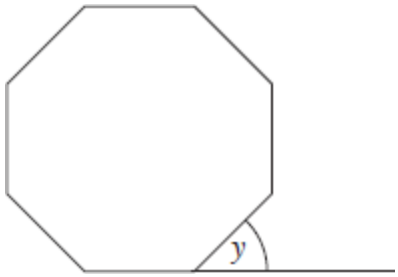
8) The diagram shows a prism



Work out the surface area of the prism

12) (a) The diagram shows a regular octagon.

Not drawn accurately

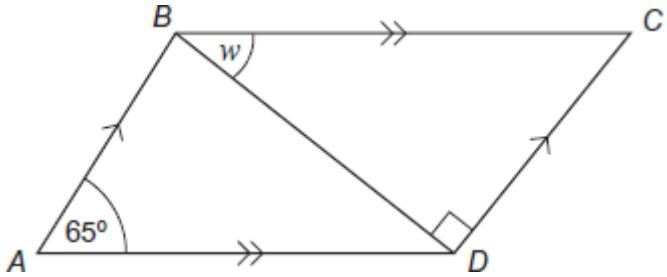


The base line of the octagon is extended.
Work out the size of angle *y*.

(2)

(b) *ABCD* is a parallelogram.
BD is a diagonal.

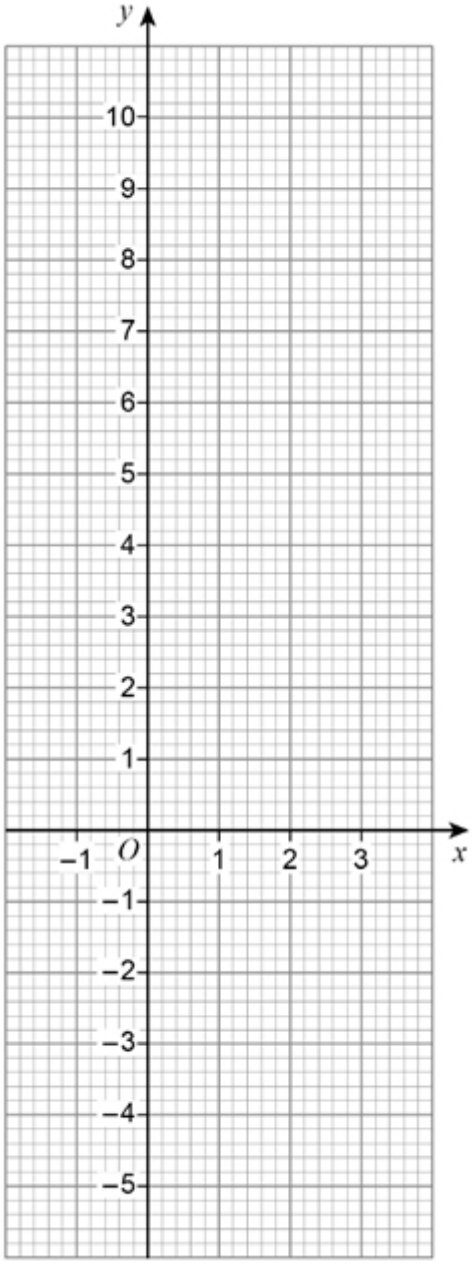
Not drawn accurately



Work out the size of angle *w*.

(3)
(Total 5 marks)

Q9. Draw the graph of $y = 3x - 1$ for values of x from –1 to 3



Q13. One day 460 people visit a zoo.

280 are adults.

The ratio of women to men is 4 : 3

180 are children.

$\frac{3}{5}$ of them are boys.

Jane says that altogether there were more females.

Show that she is correct.

Q14.

Use approximations to 1 significant figure to estimate the value of

$$\frac{0.526 \times 39.6^2}{\sqrt{97.65}}$$

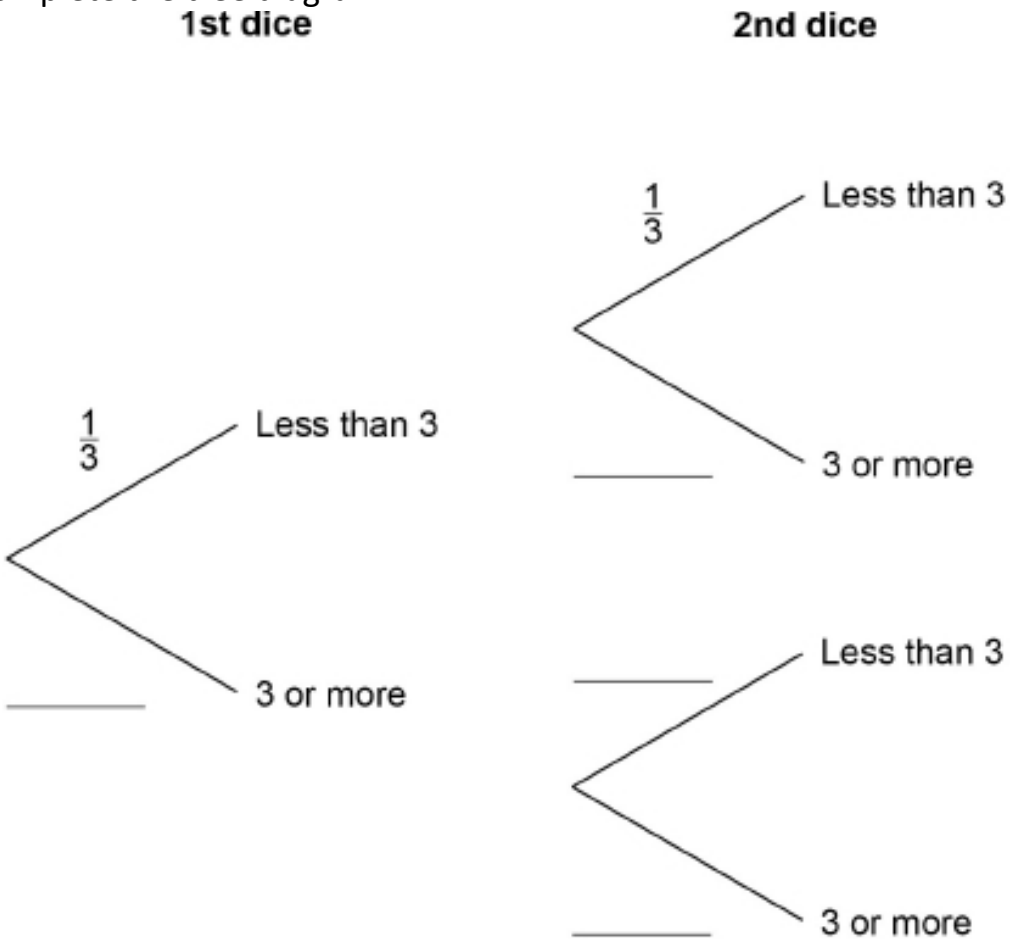
You **must** show your working.

(Total 3 marks)

Q11.

Two ordinary fair dice are rolled.

(a) Complete the tree diagram.



(b) Work out the probability that **both** dice land on a number less than 3

(c) Work out the probability that **exactly one** of the dice lands on a number less than 3

15) Here is a map of France.

Scale: 1 cm represents 80 km

(a) What is the three-figure bearing of Lyon from Bordeaux?

005° 085° 095° 175°

(b) Work out the actual straight-line distance from Paris to Marseille.

16) (a) $E = mv^2$

Work out the value of E when $m = 3$ and $v = 10$

(b) Julie and Phil rearrange $E = mv^2$ to make v the subject.

Here are their answers.

Julie

$E = mv^2$

$\frac{E}{m} = v^2$

$\sqrt{\frac{E}{m}} = v$

$v = \sqrt{\frac{E}{m}}$

Phil

$E = mv^2$

$\sqrt{E} = mv$

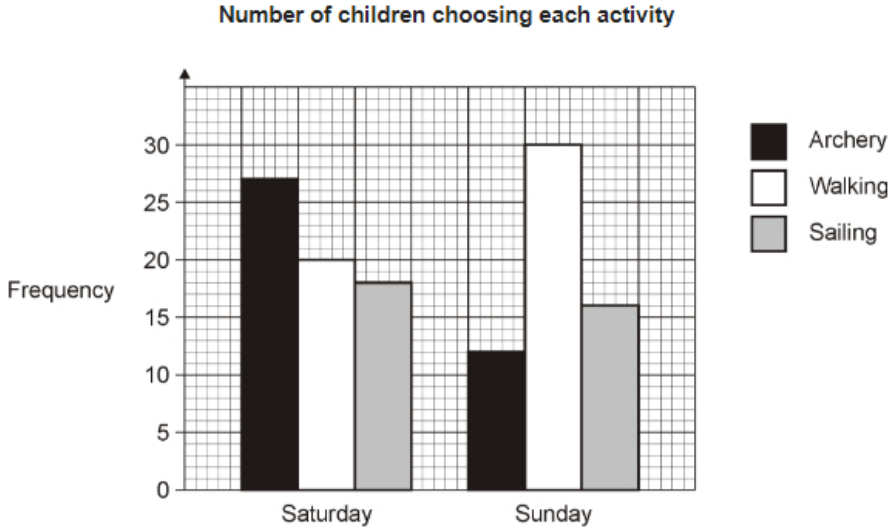
$\sqrt{\frac{E}{m}} = v$

$v = \sqrt{\frac{E}{m}}$

Which student has rearranged the formula correctly?

What mistake has the other student made?

Q17. An outdoor centre has activities for children.



(a) Adults help with **walking** in the ratio

number of adults : number of children = 1 : 5

3 adults can help with walking on **Saturday**.

Is this enough?

You **must** show your working.

(2)

(b) A group of people go **sailing** in the ratio

number of adults : number of children = 1 : 2

What fraction of the group are adults?

(1)

(c) On **Sunday** all the children do the activity they choose.

The ratios for each activity are shown in the table.

Activity	**Number of adults : number of children**
Archery	1 : 3
Walking	1 : 5
Sailing	1 : 2

Work out the total number of adults needed for Sunday.**(3)**

Calculator Paper

1) Which of these numbers has **exactly** two factors?

6 7 8 9

2) x = 2500 to the nearest 100

What is the smallest possible value of x.

3) A gym has 275 members.

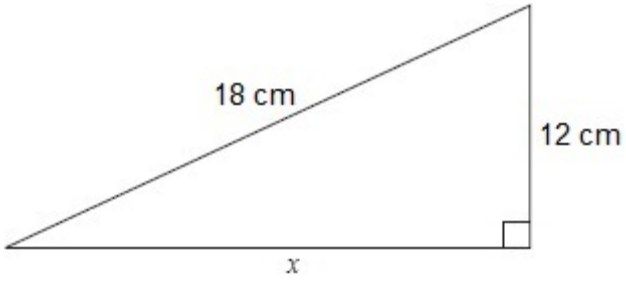
40% are bronze members.
28% are silver members.
The rest are gold members.

Work out the number of gold members.

4) The bearing of *A* from *B* is 310°

Calculate the bearing of *B* from *A*.

6) Work out the length *x*.



Not drawn accurately

Give your answer to 1 decimal place.

7) (a) Simplify fully $3a^2 + 7a + 3 - a^2 + 8a - 4$

(b) Factorise fully $24y^2 - 20y$

9) A regular polygon has an exterior angle of 20°

Work out the number of sides of the polygon.

11) The table shows the number of films watched one week by 30 people.

Number of films	**Frequency**	
0	5	
1	9	
2	8	
3	6	
4	2	

(a) Write down the modal number of films watched.

(b) Work out the mean number of films watched per person.

14) A car owner is comparing the cost of repairing her car at two garages.

	Cost of labour per hour	**Cost of parts**
Garage A	£64	£152
Garage B	£93	£137

This formula is used to work out the total cost at each garage.

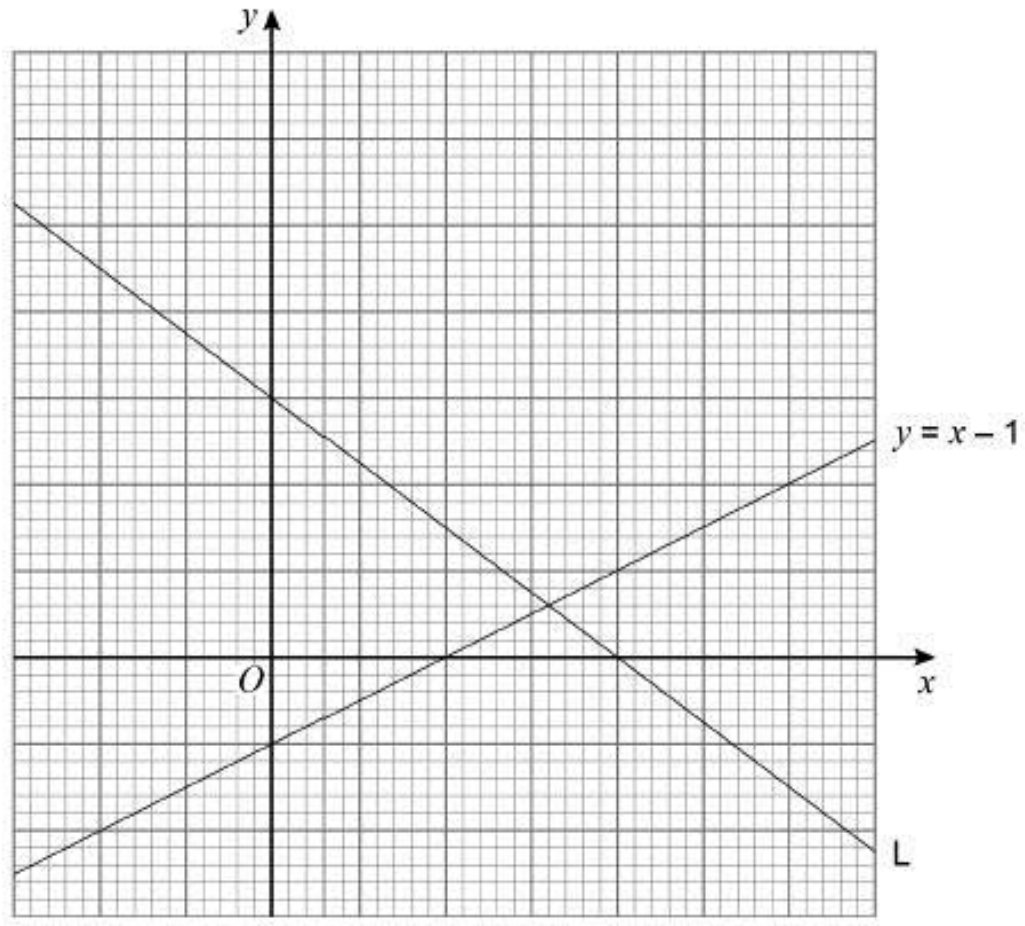
Total cost = cost of labour × number of hours + cost of parts

The repair takes $2\frac{1}{2}$ hours.

How much **cheaper** is garage A?

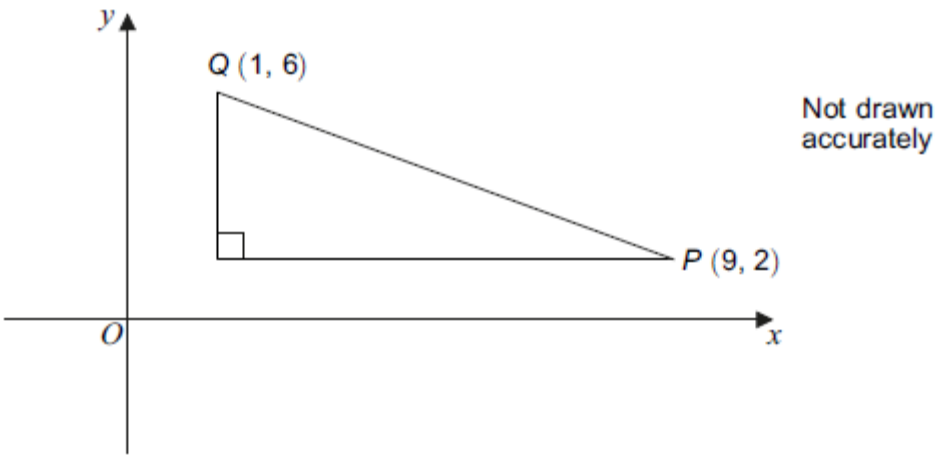
12) Here is line L and the graph of $y = x - 1$

The scales of the axes are not shown.



Work out the equation of line L.

Q15.



Work out the length of *PQ*.

Give your answer to 3 significant figures.

(Total 4 marks)

Non-Calc Answers

1. $2^2 \times 3^2$
2. Geography
3. $y = 3x$
4. $\frac{9}{25}$

6. 3c+13

7. (a) $\frac{2}{5}$

(b) 40

10. $2xy$

8. 434

12. (a) 45^o

(b) 25^0

13. Proof

14. 80

11. (b) $\frac{1}{9}$

(c) $\frac{4}{9}$

15. (a) 085^o

16. (a) 300

(b) Julie

17. (a) No

(b) $\frac{1}{3}$

(c) 18

Calc Answers

1. 7

2. 2450

3. 88

4.

6. 13.4

7. (a) $2a^2 + 15a - 1$

9. 18

11. (a) 1

(b)1.7

12. $y = -\frac{3}{2}x + 3$

14. £57.50

15. 8.94