SURNAME:

FIRST NAME:

PRESENT SCHOOL:

Stowe

ACADEMIC SCHOLARSHIP PAPER: Maths

Time Allowed: 1 hour

Total Marks: 82 marks

Please write answers in the spaces provided. Candidates are not allowed access to a calculator for this paper.

1 A man drives a truck for 2 hours and 15 minutes at an average speed of 36 km / h.
How far does he travel?

..... km

(Total for question = 2 marks)

2 (a) Work out $12 + 24 \div (8 - 5)$

.....

(2)

(b) Write 180 as a product of its prime factors.

.....

(2)

(c) Find the nth term of the sequence

9, 17, 25, 33, 41, ...

.....

(2)

(Total for question = 6 marks)

3 If $3y = 2x + 1$, find the value of x when $y = 7$

$x =$ .....

(Total for question = 2 marks)

4 (a) Write two possible pairs of solutions to the equation

$$2x + y = 31$$

(i) $x =$ ..... $y =$ .....

(ii) $x =$ ..... $y =$ .....

(2)

(b) Write down the next term in the sequence

10.5, 12, 14.5, 18, 22.5, ...

.....

(1)

(c) Calculate

$$(\sqrt{144} + 4)^2 \div (24 - 4^2)$$

.....

(2)

(Total for question = 5 marks)

5 Adil, Ben and Carl have \$12 each.

Adil spends \$7.05 of his \$12

Ben spends $\frac{3}{5}$ of his \$12

Carl spends 58% of his \$12

Who has the most money left?

You must show all your working.

.....

(Total for question = 3 marks)

Q6.

A group of students is made up of boys and girls.

Each student gets a red pen or a green pen.

The two-way table below shows how many students get red pens or green pens.

	Red pens	Green pens	TOTAL
Boys	9		17
Girls	13		
TOTAL			36

(a) Complete the table.

(2)

(b) One boy is selected at random.

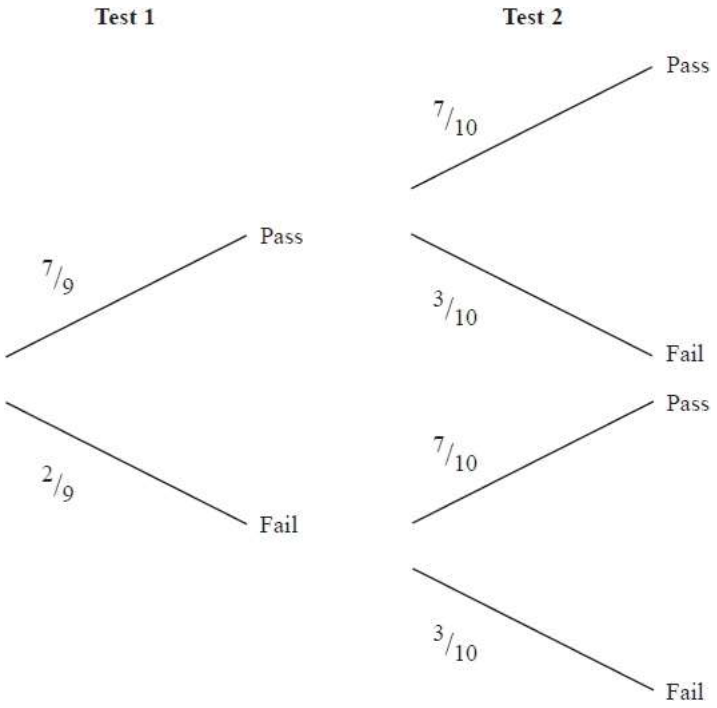
What is the probability that he has a red pen?

.....

(2)

All the students complete two tests.

The tree diagram below shows the probability that a student passes each of the tests.



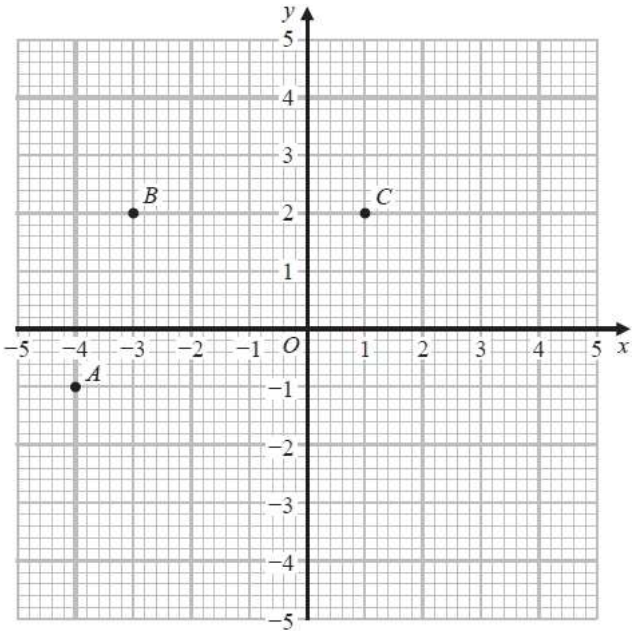
(c) Work out the probability that a student passes exactly one of the two tests.

.....

(3)

(Total for question = 7 marks)

7 (a) On the grid, draw the graph of $y = -3$ for values of x from -5 to 5



(1)

(b) Write down the coordinates of D such that $ABCD$ is a parallelogram.

.....

(1)

(c) Find the midpoint of the line with end points (-6, 5) and (2, 12).

.....

(2)

(Total for question = 4 marks)

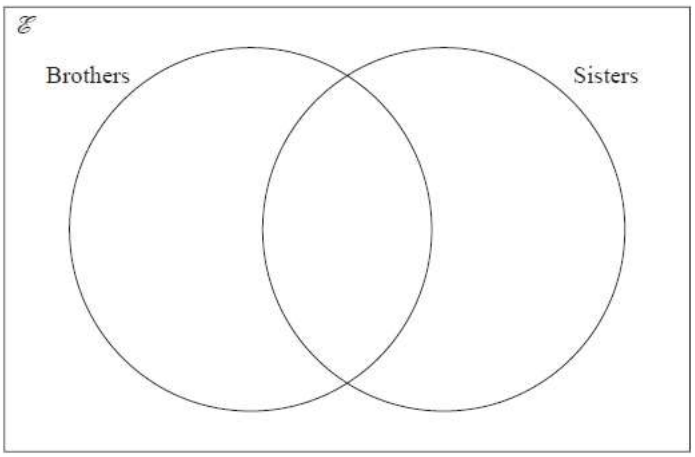
8 There are 32 students in a class.

15 of the students have a brother.

20 of the students have a sister.

8 of the students have neither a brother nor a sister.

(a) Use this information to complete the Venn diagram.



(2)

(b) One student is chosen from the class above at random.

What is the probability that the student chosen has a brother and a sister?

.....

(1)

(Total for question = 3 marks)

9 (a) Expand and simplify

$$9k + 14 - 4\,(3k - 6)$$

.....

(2)

(b) Expand and simplify

$$(w + 4)\,(w - 5)$$

.....

(2)

(c) Make q the subject of

$$p = \sqrt{\frac{7q}{5}}$$

.....

(3)

(d) Solve

$$\frac{7x+1}{5} = 2x + 5$$

.....

(3)

(e) Write in its simplest form

$$y^0$$

.....

(1)

(f) Write in its simplest form

$$\frac{z^4 \times z^3}{z^2}$$

.....

(2)

(Total for question = 13 marks)

10 (a) List all integers that satisfy the inequality

$$-2 \leqslant x < 4$$

.....

(1)

(b) Solve

$$3x - 7 > 13$$

.....

(2)

(c) Solve

$$x^2 + 7x - 18 = 0$$

x = ...

(3)

(d) Solve

$$\frac{3x + 5}{6} = \frac{2x - 4}{5}$$

x = ...

(3)

(Total for question = 9 marks)

11 Two teachers visit the same cafe to buy some cakes and some drinks.

All cakes are the same price.
All drinks are the same price.

One teacher buys 3 cakes and 2 drinks for $7.90

The other teacher buys 5 cakes and 4 drinks for $14.30

Work out the cost of one cake and the cost of one drink.

Cake = $ .....

Drink = $ .....

(Total for question = 4 marks)

12 A doctor is 21 years older than his daughter.

The doctor is also 38 years younger than his father.

The ages of the doctor, his daughter and his father add up to 158

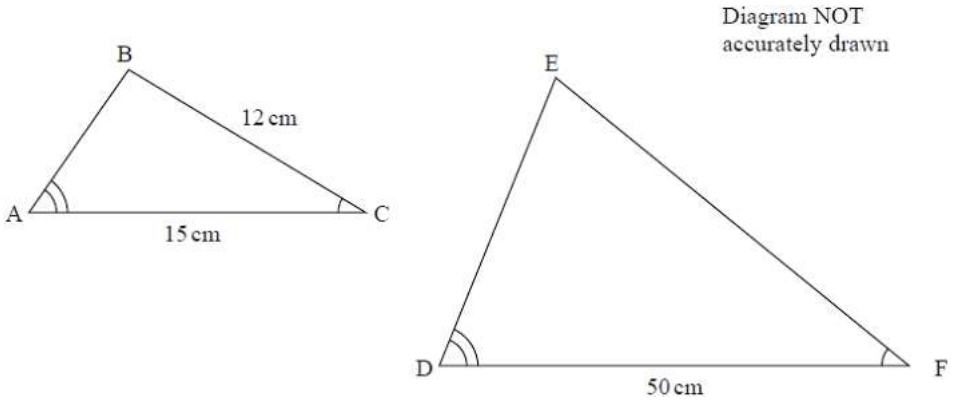
How old is the doctor?

.....

(Total for question = 2 marks)

13 Triangles ABC and DEF are similar.

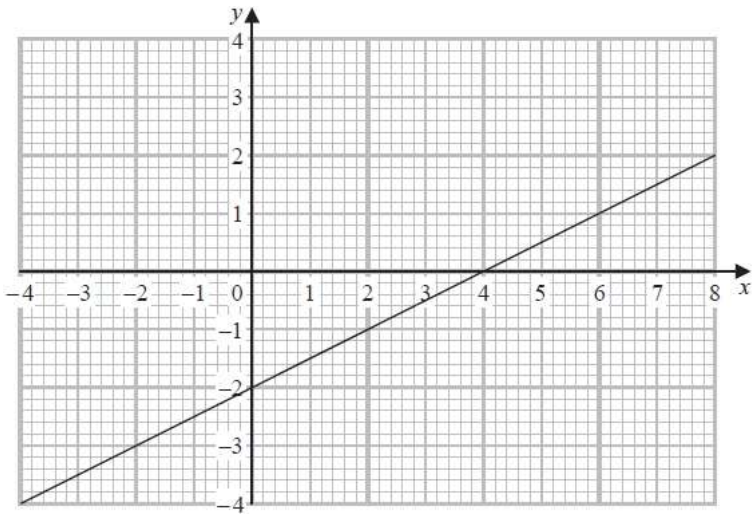
Calculate the length of EF.



..... cm

(Total for question = 2 marks)

14 (a) Find the equation of the line below.



.....

(3)

(b) On the axes above, draw the line $x = 2$

(1)

(Total for question = 3 marks)

15 Oladapo writes down three different numbers.

All three of the numbers are positive integers.

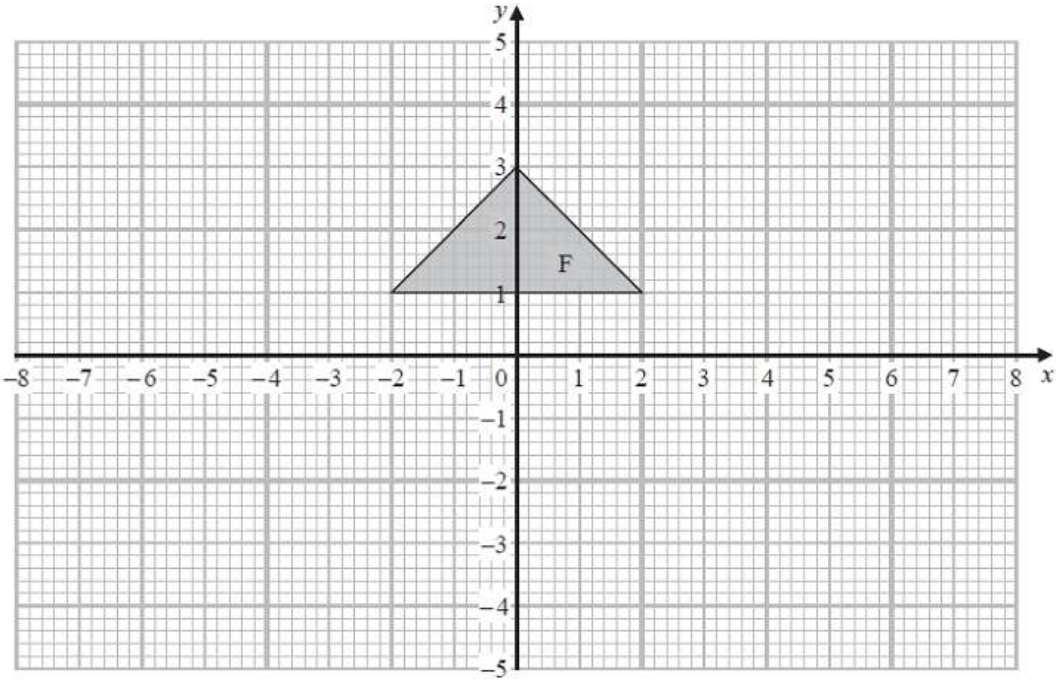
The three numbers have a mean of 15 and a range of 41

What is the median of the three numbers?

.....

(Total for question = 3 marks)

16 On the grid below, enlarge shape F by a scale factor of $-\frac{1}{2}$ about the centre (4, 1)



(Total for question = 3 marks)

17 Work out

$$\frac{(4\times10^{5})+(2\times10^{6})}{(4.8\times10^{-3})}$$

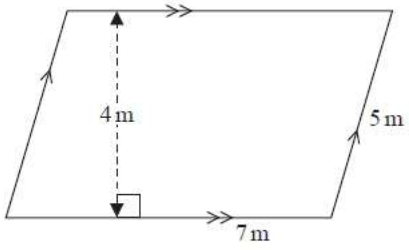
Give your answer in standard form.

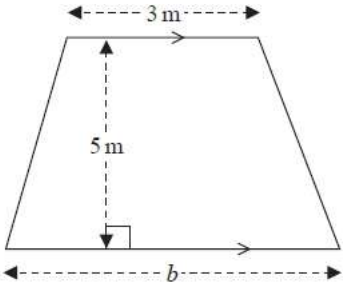
.....

(Total for question = 2 marks)

18 The area of the parallelogram and the area of the trapezium are equal.

Calculate the length of the side marked *b* in the trapezium?

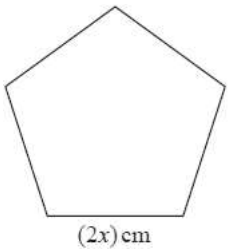


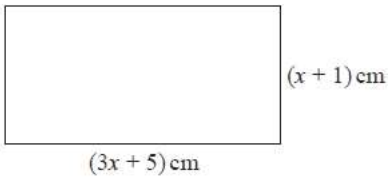


..... m

(Total for question = 4 marks)

19 The perimeters of the regular pentagon and the rectangle below are equal.





Find the area of the rectangle.

..... cm^2

(Total for question = 4 marks)

END OF PAPER