SURNAME:

FIRST NAME:

PRESENT SCHOOL:

Stowe

ROXBURGH SCHOLARSHIP PAPER: Maths

Time Allowed: 1 hour

Total Marks: 81 marks

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

1. Yoko flew on a plane from Tokyo to Sydney.
The plane flew a distance of 7800 km.
The flight time was 9 hours 45 minutes.
Work out the average speed of the plane in kilometres per hour.

.....km/h

(Total for question = 3 marks)

2.

$3780 = 2^2 \times 3^3 \times 5 \times 7$	$3240 = 2^3 \times 3^4 \times 5$

(a) Find the highest common factor (HCF) of 3780 and 3240
Give your answer as a product of prime factors.

.....

(2)

(b) Find the lowest common multiple (LCM) of 3780 and 3240
Give your answer as a product of prime factors.

.....

(2)

(Total for question = 4 marks)

3. Show that $4\frac{2}{3} + 3\frac{4}{5} = 8\frac{7}{15}$

(Total for question = 3 marks)

4. The diagram shows a shape.

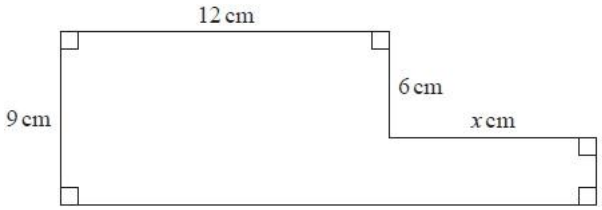


Diagram **NOT** accurately drawn

The shape has area 129 cm^2

Work out the value of x.

x = ...

(Total for question = 4 marks)

5. (a) Put brackets in the following to make the calculation correct.

(i) $2 + 4 \times 6 - 3 = 33$

(ii) $2 + 4 \times 6 - 3 = 14$

(2)

(b) Work out the value of $\frac{20-4}{2} - \frac{18}{6-3}$

.....

(2)

(Total for question = 4 marks)

6 (a) Simplify $4x + 3x$

.....

(1)

(b) Simplify $5 \times 3y$

.....

(1)

$f = 5p - 4v$

(c) (i) $p = -4$, $v = 3$

Work out the value of f.

$f =$ .....

(ii) $f = -22$, $v = -5$

Work out the value of p.

$p =$ .....

(5)

(Total for Question is 7 marks)

Q7 (a) Which one of these fractions is equivalent to $\frac{2}{3}$?

$\frac{9}{15}$ $\frac{10}{12}$ $\frac{8}{9}$ $\frac{12}{18}$ $\frac{20}{24}$

.....

(1)

(b) Work out $\frac{3}{7}$ of 840 kg.

..... kg

(2)

There are 240 cars in a car park.
96 of these cars are red.

(c) What fraction of the cars in the car park are red?

Give your fraction in its simplest form.

.....

(2)

$\frac{2}{9}$ of a number is 8

(d) What is the number?

.....

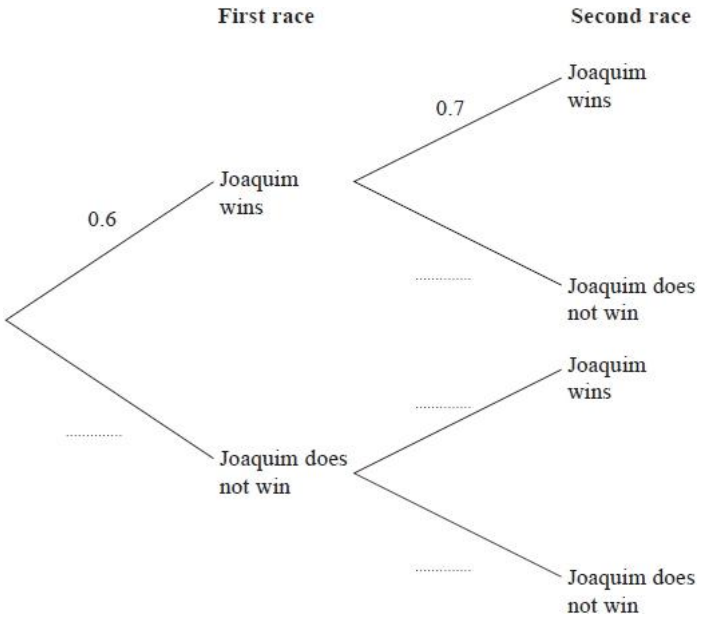
(2)

(Total for question = 7 marks)

Q8 Joaquim takes part in two cycle races.

The probability that he wins the first race is 0.6
The probability that he wins the second race is 0.7

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that Joaquim wins both races.

.....

(2)

Joaquim takes part in a third cycle race.
The probability that Joaquim wins the third race is 0.2

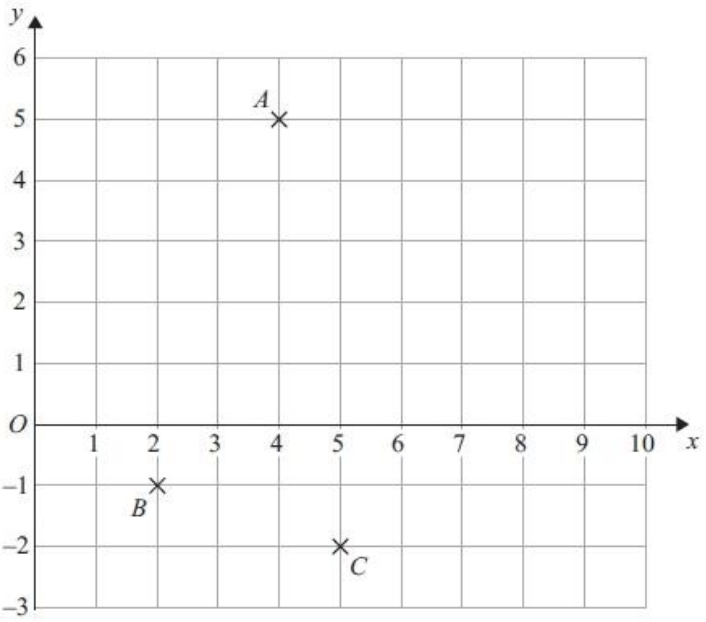
(c) Work out the probability that he wins exactly one of the three races.

.....

(3)

(Total for question = 7 marks)

Q9 The diagram shows three points, *A*, *B* and *C*, on a centimetre grid.



(a) Write down the coordinates of
(i) *A*,

(..... , ...)

(ii) *B*.

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

(b) (i) On the diagram, mark with a cross (×) the point D so that *ABCD* is a rectangle.
Label your point *D*.
(ii) On the diagram, draw rectangle *ABCD*.

(2)

(c) Write down the order of rotational symmetry of rectangle *ABCD*.

.....
(1)

(d) Find the coordinates of the midpoint of *AB*.

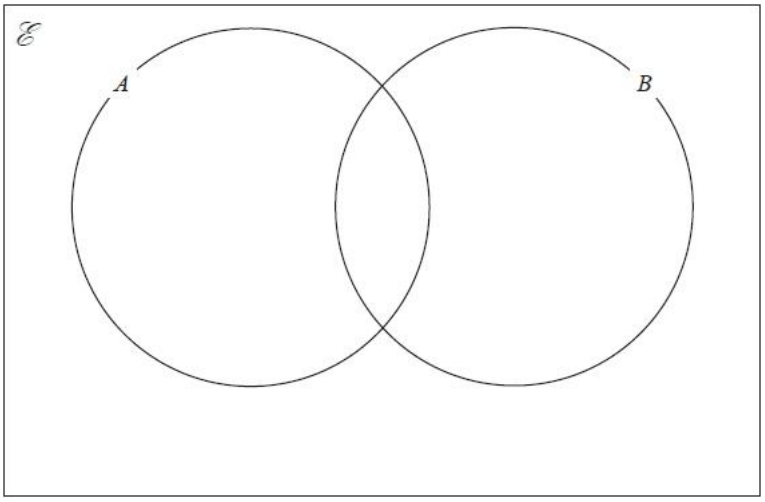
(..... , ...)
(2)

(Total for question = 7 marks)

10 $\mathscr{E}$ = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15

A = even numbers

B = multiples of 3



Complete the Venn diagram for the sets $\mathscr{E}$, A and B.

(Total for question = 3 marks)

11 (a) Write 0.000451 in standard form.

.....

(1)

(b) Work out $\frac{7.8 \times 10^5}{2.4 \times 10^{-4}}$

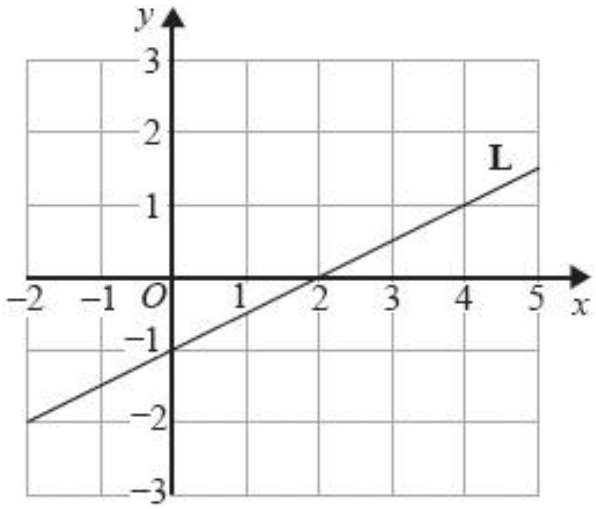
Give your answer in standard form.

.....

(2)

(Total for question = 3 marks)

12 The straight line **L** is shown on the grid.



(a) Find an equation of **L**.

.....

(2)

(b) Find an equation of the line that is parallel to **L** and passes through the point (5, 4)

.....

(2)

(Total for question = 4 marks)

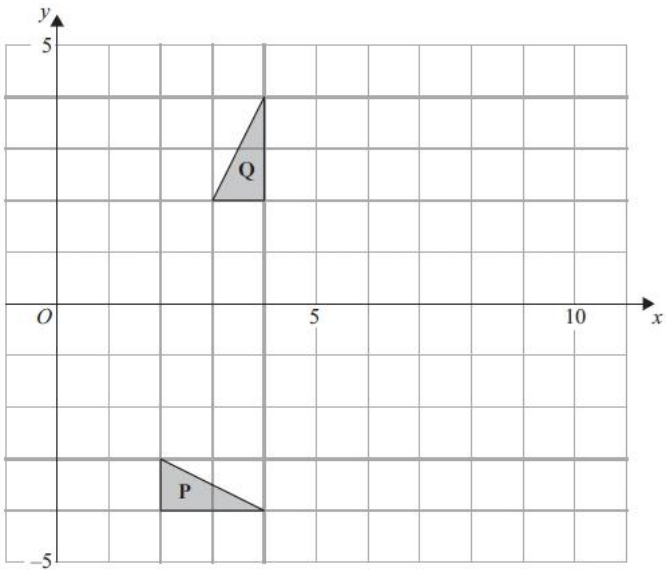
13 The mean of four numbers is 2.6
One of the four numbers is 5

Find the mean of the other three numbers.

.....

(Total for Question is 3 marks)

14



(a) Describe fully the single transformation which maps triangle **P** onto triangle **Q**.

.....

.....

(3)

(b) On the grid, translate triangle **Q** 4 squares to the right and 2 squares down.
Label the new triangle **R**.

(1)

(Total for question is 4 marks)

15 Calvin has 8 identical rectangular tiles and 4 identical square tiles.
He arranges the tiles to fit exactly round the edge of a rectangle, as shown in the diagram below.

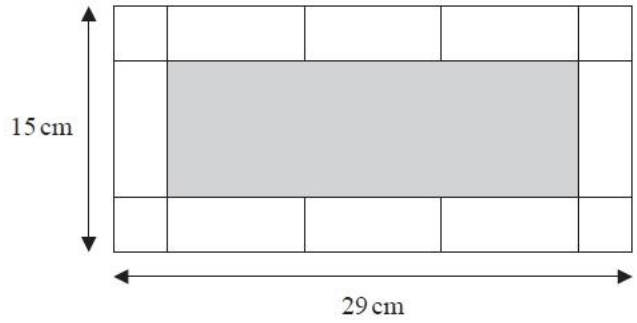


Diagram **NOT** accurately drawn

Work out the area of one of Calvin's rectangular tiles.

..... cm^2

(Total for question = 5 marks)

16 (a) Expand and simplify $(m - 8)(m + 5)$

.....

(2)

(b) Factorise fully $5y + 20y^2$

.....

(2)

(c) Simplify $(p^2 + 3)^0$

.....

(1)

(d) Solve $3(2x - 5) = \frac{9 - x}{2}$

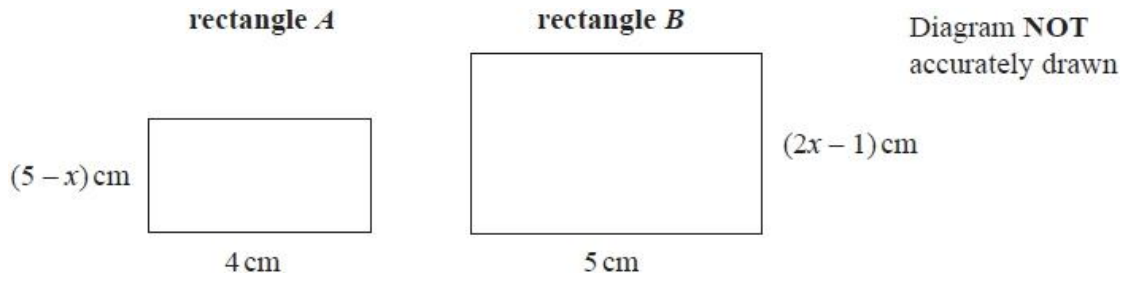
Show clear algebraic working.

x = ...

(4)

(Total for question = 9 marks)

17 Here are two rectangles, rectangle *A* and rectangle *B*.



The area of rectangle *B* is twice the area of rectangle *A*.

Work out the value of *x*.
Show your working clearly.

x = ...

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

END OF PAPER