



OUNDLE

School

2019 Academic Scholarship

Mathematics

Paper I

Time Allowed: **1 hour and 30 minutes**

Calculators are **NOT** allowed

Instructions to candidates:

- Answer on the lined paper provided.
- You are not expected to have time to do all the questions.
- You may answer the questions in any order.
- Choose those questions which you think you can answer best.
- **Remember to show your working and clearly show the method you are using.**
- Give answers to 3 significant figures where needed.
- The number of marks for each question is shown in square brackets.

Question 1 Work out the following.

- a) 49% of 23
- b) $14 \times 39 + 86 \times 39$
- c) $44 \times 16 + 22 \times 68$
- d) $5\frac{1}{3} + 1\frac{2}{5}$

[8]

Question 2 Simplify the following expressions fully.

- a) $ab - 4a^2 + 1a \times b + a \times 3a$
- b) $2x + 3(4 - x) - (3x - 5)$
- c) $96x^3 \div 12x^2$
- d) $x^2 - 3x + 2x(5 - 3x)$

[8]

Question 3 Solve the following equations

- a) $5x - 4 = 3x + 2(3 - x)$
- b) $2x - 7 = \frac{1}{2}x$
- c) $5x^2 - 80 = 0$
- d) $\frac{4x - 3}{2 - x} = 6$

[8]

Question 4

- a) I think of a number and subtract 3. I multiply the result by 4 and get a final answer of -60. What was my number?
- b) I think of a number, multiply it by 5 and then add 6. Twice the result is 182. What was my number?

[4]

Question 5

The list p, q, r, s consists of four consecutive integers listed in increasing order. If $p + s = 109$, what is the value of $q + r$?
Show clear working.

[4]

Question 6

If x is less than -2 , which of the following expressions has the least value?
Show clear working and make your choice clear.

x $x + 2$ $\frac{1}{2}x$ $x - 2$ $2x$

[4]

Question 7

In a magic square, the numbers in each row, the numbers in each column, and the numbers on each diagonal have the same sum.

In the magic square shown, what is the value of x ?

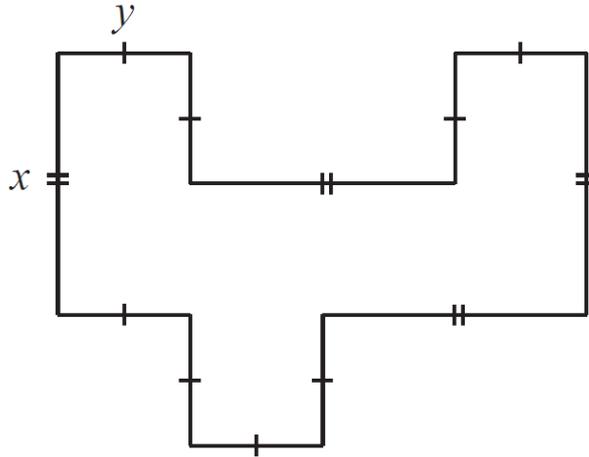
Show clear working.

2.3		
3.6	3	2.4
	x	

[4]

Question 8

In the diagram, each line segment has length x or y . Also, each pair of adjacent sides is perpendicular.



If the area of the figure is 252 and $x = 2y$, what is the perimeter of the figure?

Show clear working.

[4]

Question 9

Hagrid has 100 animals. Among these animals,

- each is either striped or spotted but not both,
- each has either wings or horns but not both,
- there are 28 striped animals with wings,
- there are 62 spotted animals, and
- there are 36 animals with horns.

How many of Hagrid's spotted animals have horns?

Show clear working.

[4]

Question 10

There are six identical red balls and three identical green balls in a bucket.

Four of these balls are selected at random and then these four balls are arranged in a line in some order.

How many different-looking arrangements are possible?

Show clear working.

[4]

Question 11

What is the units digit of the integer equal to $5^{2019} - 3^{2019}$?

Show clear working.

[6]

Question 12

The integer 2019 can be formed by placing two consecutive two-digit positive integers, 19 and 20, in decreasing order.

What is the sum of all four-digit positive integers greater than 2019 that can be formed in this way?

Show clear working.

[6]