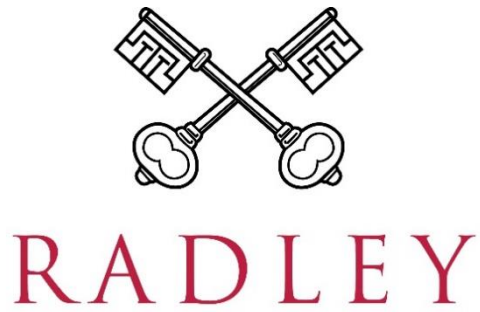




Academic Scholarship Examination Paper

MATHEMATICS I

19th January 2026

Time allowed – 1 hour

There are 12 questions in total

The last part of each question is generally the most difficult part

No calculating aids may be used

Show all working.

Answer the questions in the spaces provided. If you run out of space please add your solutions on the end, numbering the pages.

Name	
School	

1. Find the value of

a. 17^2 *(1 mark)*

.....

b. 1.7^2 *(1 mark)*

.....

c. 170^2 *(1 mark)*

.....

d. $17^2 \div 0.17^2$ *(2 marks)*

.....

2. Work out the following

a. $12 - 3 \times 2 + 7$

(1 mark)

.....

b. $4 \times (2 + 5 \times 4) - 9 \times 2$

(2 marks)

.....

c. $3\frac{1}{5} - 2\frac{3}{4}$

(2 marks)

.....

d. $1\frac{9}{12} \div \frac{7}{16}$

(2 marks)

.....

3. If $a = 7$, $b = -3$ and $c = \frac{1}{4}$

Find the value of

a. $b^2 - a$

(2 marks)

.....

b. $\frac{b^2+a}{c}$

(2 marks)

.....

c. $ac - b$

(2 marks)

.....

4. What is the 5th term and the n th term in the following sequences?

a. $3, 7, 11, 15, \dots$

(3 marks)

$$5^{\text{th}} \text{ term} =$$

$$n\text{th term} =$$

b. $\frac{1}{3}, \frac{2}{5}, \frac{3}{7}, \frac{4}{9}, \dots$

(3 marks)

$$5^{\text{th}} \text{ term} =$$

$$n\text{th term} =$$

c. $\frac{3}{4}, \frac{6}{7}, \frac{9}{12}, \frac{12}{19}, \dots$

(3 marks)

$$5^{\text{th}} \text{ term} =$$

$$n\text{th term} =$$

5. Multiply out and simplify where possible.

a. $2(x - 7) - 3(x - 11) + 4x + 2$ *(3 marks)*

.....

b. $(x + 2y)(3x - 4y)(x - 2y)$ *(4 marks)*

.....

6. Factorise the following expressions completely,

a. $8x + 16$ *(2 marks)*

.....

b. $3x - 15x^2$ *(2 marks)*

.....

c. $4xy^4 - 8x^3y^2 + 48x^4y^5$ *(3 marks)*

.....

d. $3x^2 - 75$ *(2 marks)*

.....

e. $x^2 + 3x - 28$

(3 marks)

.....

f. $2x^2 - 3x - 14$

(3 marks)

.....

g. $12x^2 - 31x + 20$

(3 marks)

.....

7. Give the following as powers of 2.

a. 16×4^0

(2 marks)

.....

b. $\frac{32}{8^3}$

(3 marks)

.....

c. $\frac{16^{2x-2}}{4^{3x+1}}$

(3 marks)

.....

8.

a. A Ferrari Roma costs £150,000 excluding VAT. What is the price when VAT at 20% is added?

(2 marks)

.....

b. Dave wants to buy a certain sports coat. He has £99 in the bank. At full price it is value at £120. The coat is reduced by 10%, then a week later it is reduced by 10% again. Can Dave now buy the coat?

Use a calculation to support your answer.

(3 marks)

9. Solve the following equations.

a. $4x - 3 = 2x + 5$ (2 marks)

.....

b. $2x^2 = 14x$ (3 marks)

.....

c. $3x + 14 = \frac{5}{x}$ (3 marks)

.....

d. $\frac{4x+1}{3} - \frac{3x-2}{2} = \frac{9-x}{8}$ (5 marks)

.....

10.

- a. I have 4 positive integers. The Mode is 12, the Median is 13 and the Mean is 14.

Find the integers.

(3 marks)

.....

- b. I have 4 different integers. The Range is 10, the Mean is 14 and the Mode is 14.

Find the integers.

(3 marks)

.....

11.

I toss a coin 4 times.

- a. How many tails would I expect to get?

(1 mark)

.....

- b. What is the probability of getting 0 tails?

(2 marks)

.....

- c. What is the probability of getting 1 tail?

(2 marks)

.....

12.

- a. Solve the following equations to find x and y .

$$x + 12y = 39$$

$$2x + 6y = 42$$

(3 marks)

.....

- b. I have a collection of 5pence and 2pence pieces.

After giving away 17 coins worth 46pence to a friend, I have also got 46p left but fewer coins than my friend.

- a. What is the smallest number of coins I could have started with?
b. What is the largest number of coins I could have started with?

(4 marks)

a.....

b.....

c. If, $xy = \frac{1}{3}$ and $x + y = \frac{13}{6}$

Find the values of x and y .

(4 marks)

.....

END OF QUESTIONS.