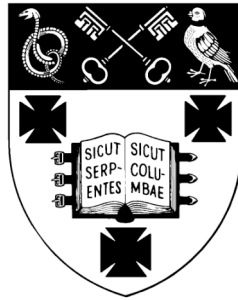


RADLEY COLLEGE
Entrance Scholarships



MATHEMATICS I

March 2009

Time allowed 1 hour

You may try the questions in any order.

No calculating aids may be used.

Show all working.



1. a) Work out exactly
- i) 38.4×4.09 (3 marks)
- ii) $6.6728 \div 0.38$ (3 marks)
- b) Give the answers to the following as fractions in their simplest form
- i) $\frac{19}{24} - \frac{1}{8}$ (3 marks)
- ii) $4\frac{3}{5} \div 6\frac{4}{7}$ (3 marks)
- iii) $\left(3\frac{1}{7} + 4\frac{2}{3}\right) \times 7\frac{7}{8}$ (4 marks)
2. Work out as simply as possible
- a) $824^2 - 176^2$ (4 marks)
- b) $(94 \times 67) + 67^2 - (67 \times 61)$ (4 marks)
- c) $(42 \times 73) + (27 \times 56) + (73 \times 31) - (83 \times 27)$ (4 marks)
- d) $\frac{463^2 + (463 \times 137)}{4.63 \times 24}$ (5 marks)
3. a) Multiply out and simplify
- i) $(3a - b)^2$ (3 marks)
- ii) $(20x^2 + 10xy + 5y^2)(2x - y)$ (3 marks)
- b) Factorise fully
- i) $14a^2b + 21ab^2$ (3 marks)
- ii) $45x^2 - 20y^2$ (3 marks)
- iii) $x^2 + 3x - 18$ (3 marks)

c) Simplify

i) $\frac{5x^4}{15x^3 - 25x}$ (3 marks)

ii) $\frac{x^2}{y^3} \div xy^2$ (3 marks)

4. Solve each of these equations for x

a) $8(2x + 3) - 5(x + 3) = 53$ (3 marks)

b) $\frac{3x - 4}{7} + \frac{2x + 3}{3} = 7$ (4 marks)

c) $(x + 6)^2 - (x + 4)(x - 1) = 58$ (5 marks)

Rearrange the following formula to make x the subject

d) $\frac{a}{x - b} = \frac{c}{x + d}$ (4 marks)

5. Solve each of these pairs of equations for x and y

a) $2x + 7y = 33$
 $5x - 2y = 24$ (6 marks)

b) $\frac{1}{2}x - \frac{2}{3}y = 1$
 $\frac{2}{3}x + \frac{3}{4}y = 21$ (6 marks)

6. Solve each of these equations for x

a) $x^2 + 7x + 12 = 0$ (4 marks)

b) $3x^2 - 14x + 15 = 0$ (6 marks)

c) $\frac{30}{x - 2} - \frac{12}{x + 5} = 5$ (8 marks)

Total 100 marks