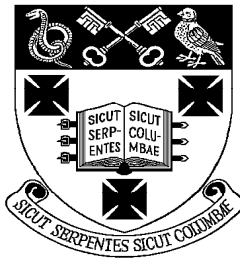


RADLEY COLLEGE
Entrance Scholarships



MATHEMATICS I

March 2006

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) 7.05×96.2 (3 marks)

ii) $3.6288 \div 0.28$ (3 marks)

b) Give the answers to the following as fractions in their simplest form

i) $\frac{5}{8} + \frac{1}{24}$ (3 marks)

ii) $3\frac{3}{5} \times 2\frac{4}{9}$ (3 marks)

iii) $\left(4\frac{1}{3} - 2\frac{3}{4}\right) \div 1\frac{3}{16}$ (4 marks)

2. Work out as simply as possible

a) $562^2 - 438^2$ (4 marks)

b) $(34 \times 89) + 34^2 - (23 \times 34)$ (4 marks)

c) $(89 \times 35) + (65 \times 11) - (11 \times 76) + (54 \times 89)$ (4 marks)

d) $\frac{(400 \times 306) - 306^2}{3.06 \times 47}$ (4 marks)

3. a) Multiply out and simplify

i) $(3a + 4b)^2$ (3 marks)

ii) $(3x^2 + 6xy + 12y^2)(x - 2y)$ (3 marks)

b) Factorise fully

i) $18ab - 12a^2b$ (3 marks)

ii) $18a^2 - 50b^2$ (3 marks)

iii) $x^2 + 17x + 60$ (3 marks)

c) Simplify

i) $\frac{x^2 - y^2}{xz + yz}$ (3 marks)

ii) $\frac{x^2}{y^3} \div \frac{x^3}{y^5}$ (3 marks)

4. Solve each of these equations for x

a) $8(x + 3) - 3(x - 1) = 57$ (3 marks)

b) $\frac{x + 8}{7} + \frac{2x + 3}{5} = 5$ (4 marks)

c) $(3x + 1)(x + 5) - 3x^2 = 117$ (4 marks)

Rearrange the following formula to make x the subject

d) $\frac{a}{x + b} = \frac{c}{x - d}$ (6 marks)

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

a) $3x + 5y = 19$
 $4x - 3y = 6$ (6 marks)

b) $\frac{1}{8}x + \frac{1}{7}y = 8$
 $\frac{3}{4}x + \frac{2}{5}y = 32$ (6 marks)

6. Solve each of these equations for x

a) $x^2 - 7x - 18 = 0$ (4 marks)

b) $4x^2 - 8x + 3 = 0$ (6 marks)

c) $\frac{28}{x - 3} - \frac{27}{x + 2} = 4$ (8 marks)

Total **100 marks**