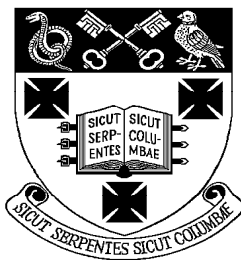


**RADLEY COLLEGE**  
**Entrance Scholarships**



**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)  $7.05 \times 96.2$  (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**

