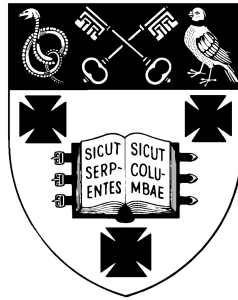


**RADLEY COLLEGE**  
**Entrance Scholarships**



**MATHEMATICS I**

March 2010

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)  $7.09 \times 4.82$  (3 marks)
- ii)  $537.742 \div 6.7$  (3 marks)
- b) Give the answers to the following as fractions in their simplest form
- i)  $\frac{2}{7} + \frac{4}{35}$  (3 marks)
- ii)  $9\frac{1}{3} \times 1\frac{1}{8}$  (3 marks)
- iii)  $\left(3\frac{5}{12} - 1\frac{1}{2}\right) \div 5\frac{3}{4}$  (4 marks)
2. Work out as simply as possible
- a)  $631^2 - 369^2$  (4 marks)
- b)  $(92 \times 73) + (73 \times 81) - 73^2$  (4 marks)
- c)  $(28 \times 83) + (17 \times 36) - (53 \times 17) + (83 \times 55)$  (4 marks)
- d)  $\frac{(529 \times 769) - 529^2}{20 \times 52.9}$  (5 marks)
3. a) Multiply out and simplify
- i)  $(4x + y)^2$  (3 marks)
- ii)  $(18a^2 - 6ab + 2b^2)(3a + b)$  (3 marks)
- b) Factorise fully
- i)  $25ab^4 - 10a^2b^3$  (3 marks)
- ii)  $50a^2 - 18b^2$  (3 marks)
- iii)  $x^2 - 4x - 21$  (3 marks)

c) Simplify

i)  $\frac{7x^2}{21x^3 + 14x}$  (3 marks)

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

4. Solve each of these equations for  $x$

a)  $3(2x - 3) + 9(x - 4) = 30$  (3 marks)

b)  $\frac{4x + 3}{5} - \frac{x - 6}{7} = 10$  (4 marks)

c)  $(x + 4)(x - 1) - (x - 4)^2 = 79$  (5 marks)

Rearrange the following formula to make  $x$  the subject

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

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

a)  $7x - 3y = 51$   
 $5x - 2y = 37$  (6 marks)

b)  $\frac{1}{2}x + \frac{4}{5}y = 17$   
 $\frac{7}{9}x + \frac{1}{2}y = 19$  (6 marks)

6. Solve each of these equations for  $x$

a)  $x^2 - 17x + 42 = 0$  (4 marks)

b)  $4x^2 + 7x - 15 = 0$  (6 marks)

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

**Total 100 marks**