**Exam Review Algebra- Sequence, Series, Exponents, Logs, and Binomial**

**1.** Find the term in *x*3 in the expansion of 

 (Total 5 marks)

**2.** Consider the infinite geometric sequence 3000, – 1800, 1080, – 648, … .

(a) Find the common ratio.

(2)

(b) Find the 10th term.

(2)

(c) Find the **exact** sum of the infinite sequence.

(2)

 (Total 6 marks)

**3.** Consider the arithmetic sequence 2, 5, 8, 11, .....

(a) Find *u*101.

(3)

(b) Find the value of n so that *un* = 152.

(3)

 (Total 6 marks)

**4.** (a) Expand  in terms of e.

(4)

(b) Express  +  as the sum of three terms.

(2)

 (Total 6 marks)

**5.** (a) Write down the first three terms of the sequence *un* = 3*n*, for *n* 1.

(1)

(b) Find

(i)  (ii) .

(5)

(Total 6 marks)

**6.** One of the terms of the expansion of (*x* + 2*y*)10 is *ax*8 *y*2. Find the value of *a*.

 (Total 6 marks)

**7.** (a) Let log*c* 3 = *p* and log*c* 5 = *q*. Find an expression in terms of *p* and *q* for

(i) log *c* 15;

(ii) log *c* 25.

(b) Find the value of *d* if log *d* 6 = .

 (Total 6 marks)

**8.** (a) Given that log3 *x* – log3 (*x* – 5) = log3 *A*, express *A* in terms of *x*.

(b) Hence or otherwise, solve the equation log3 *x* – log3 (*x* – 5) = 1.

(Total 6 marks)