# Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# **Topics 1 and 2 Review**

# Consider the infinite geometric sequence  .

1. Write down the 10th term of the sequence. Do not simplify your answer. **[1]**
2. Find the sum of the infinite sequence. **[4]**
3. Let  , for  .
4. Show that  . **[2]**
5. Write down the range of  . **[1]**
6. In a geometric series,  and .
7. Find the value of  . **[3]**
8. Find the smallest value of *n* for which  . **[4]**
9. The first three terms of an arithmetic sequence are 5 , 6.7 , 8.4 .
10. Find the common difference. **[2]**
11. Find the 28term of the sequence. **[2]**
12. Find the sum of the first 28 terms. **[2]**

 **5a.** Expand  and simplify your result. **[3]**

1. Find the term in  in  . **[3]**
2. The first term of a geometric sequence is 200 and the sum of the first four terms is 324.8.
3. Find the common ratio. **[4]**
4. Find the tenth term. **[2]**

 **7.** Let  , for  . Find the value of  , giving your answer as an integer. **[4]**

 **8.** Let  , for  .

**a.** Show that  . **[2]**

**b.** The function *f* can also be written in the form  . **[6]**

(i) Write down the value of *a* and of *b* .

(ii) Hence on graph paper, **sketch** the graph of *f* , for  ,  , using a scale of 1 cm to 1 unit on each axis.

(iii) Write down the equation of the asymptote.

1. Find the value of  and of  . **[3]**
2. Write down the value of  . **[1]**
3. The point A lies on the graph of *f* . At A,  .On your diagram, sketch the graph of  , noting clearly the image of point A. **[4]**

**9.** Consider the expansion of  .

**a.** Find *b*. **[3]**

**b.** Find *k*. **[3]**

**10.** Consider the expansion of  .

**a.** Write down the number of terms in the expansion. **[1]**

**b.** Find the term in  . **[5]**

**11.** Let  and  .

**a.** Find  . **[3]**

**b.** Find  . **[2]**

**12.** Let  , for  .

**a.** Sketch the graph of *f* . **[3]**

**b.** **[3]** (i) Write down the *x*-coordinate of the maximum point on the graph of *f* .

 (ii) Write down the interval where *f* is increasing.

1. Show that  . **[5]**
2. Find the interval where the rate of change of *f* is increasing. **[4]**

**13.** Let  ,  .

**a.** (i) Sketch the graph of *h* for  and  , including any asymptotes.

 (ii) Write down the equations of the asymptotes.

 (iii) Write down the *x*-intercept of the graph of *h* . **[7]**

1. Find  . **[4]**

 **c.** Let *R* be the region in the first quadrant enclosed by the graph of *h* , the *x*-axis and the line .**[5]**

(i) Find the area of *R*.

(ii) Write down an expression for the volume obtained when *R* is revolved through  about the *x*-axis.

**14.** Let  , for  . Part of the graph of *f* is given below.



There is an *x*-intercept at the point A, a local maximum point at M, where  and a local minimum point at N, where  .

1. Write down the *x*-coordinate of A. **[1]**

 **b.** Find the value of **[2]**

(i) *p* ;

(ii) *q* .

1. Find  . Explain why this is not the area of the shaded region. **[3]**

**15.** Let  . Part of the graph of *f* is shown below.

**a.** (i) Write down the equation of the axis of symmetry.

(ii) Find the *y*-coordinate of the vertex. **[3]**

1. Find the *x*-intercepts of the graph. **[4]**

**16.** Let  .

**a.** Express  in the form  . **[3]**

**b.** Write down the equation of the axis of symmetry of the graph of *f* . **[1]**

**c.** Express  in the form  . **[2]**

 **17.** Consider the equation  , where *k* is a real number.

Find the values of *k* for which the equation has two **equal** real solutions. **[7]**

 **18.** Solve  , for  . **[7]**

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