5 The nth term of a geometric sequence is 2×5^n. Find the first and 5th terms.

6 The sixth term of a geometric sequence is 32 and the 3rd term is 4. Find the first term and the common ratio.

E/P **8** The first three terms of a geometric sequence are given by $8 - x$, $2x$, and x^2 respectively where $x > 0$.

a Show that $x^3 - 4x^2 = 0$. **(2 marks)**

b Find the value of the 20th term. **(3 marks)**

c State, with a reason, whether 4096 is a term in the sequence. **(1 mark)**

E/P **9** A geometric sequence has first term 200 and a common ratio p where $p > 0$.
The 6th term of the sequence is 40.

a Show that p satisfies the equation $5 \log p + \log 5 = 0$. **(3 marks)**

b Hence or otherwise, find the value of p correct to 3 significant figures. **(1 mark)**

3 A geometric series has first term 5 and common ratio $\frac{2}{3}$. Find the value of S_8.

P **4** The sum of the first three terms of a geometric series is 30.5. If the first term is 8, find possible values of r.

P **5** Find the least value of n such that the sum $3 + 6 + 12 + 24 + \ldots$ to n terms exceeds 1.5 million.

P **6** Find the least value of n such that the sum $5 + 4.5 + 4.05 + \ldots$ to n terms exceeds 45.

P **6** Find the fraction equal to the recurring decimal $0.\dot{2}\dot{3}$.

Hint $0.\dot{2}\dot{3} = \frac{23}{100} + \frac{23}{10\,000} + \frac{23}{1\,000\,000} + \ldots$

7 For a geometric series $a + ar + ar^2 + \ldots$, $S_3 = 9$ and $S_\infty = 8$, find the values of a and r.

E/P **8** Given that the geometric series $1 - 2x + 4x^2 - 8x^3 + \ldots$ is convergent,

a find the range of possible values of x **(3 marks)**

b find an expression for S_∞ in terms of x. **(1 mark)**

E/P **9** In a convergent geometric series the common ratio is r and the first term is 2.
Given that $S_\infty = 16 \times S_3$,

a find the value of the common ratio, giving your answer to 4 significant figures **(3 marks)**

b find the value of the fourth term. **(2 marks)**

E/P **10** The first term of a geometric series is 30. The sum to infinity of the series is 240.

a Show that the common ratio, r, is $\frac{7}{8}$ **(2 marks)**

b Find to 3 significant figures, the difference between the 4th and 5th terms. **(2 marks)**

c Calculate the sum of the first 4 terms, giving your answer to 3 significant figures. **(2 marks)**

The sum of the first n terms of the series is greater than 180.