# 1.10 Sum of infinite Geometric sequences

**1a.** *[2 marks]*

The first two terms of an infinite geometric sequence are *u* = 18 and *u* = 12sin *θ* , where 0 < *θ* < 2 , and *θ* ≠ .

Find an expression for *r* in terms of *θ*.

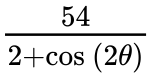


**1b.** *[3 marks]*

Find the possible values of *r*.



**1c.** *[4 marks]*

Show that the sum of the infinite sequence is .



**1d.** *[6 marks]*

Find the values of *θ* which give the greatest value of the sum.



**2a.** *[2 marks]*

The first two terms of an infinite geometric sequence, in order, are

, where .

Find .



**2b.** *[2 marks]*

Show that the sum of the infinite sequence is .



**2c.** *[2 marks]*

Let  be the sum of the first 12 terms of the arithmetic sequence.

Show that .



**2d.** *[3 marks]*

Given that  is equal to half the sum of the infinite geometric sequence, find , giving your answer in the form , where .



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