

Sequences and Series Revision

(a)	(b)	(c)
<p>In an arithmetic sequence, the 2nd term is 5 and the 15th term is -4.75. Find the first term and common difference of the sequence.</p> <p style="text-align: center; color: red;">$a = 5.75, d = -0.75$</p>	<p>The first three terms of an arithmetic progression are $2x + 1, 4x, 7x - 6$</p> <p>Find the value of x and the eighth term.</p> <p style="text-align: center; color: red;">$x = 5, 8\text{th term} = 74$</p>	<p>A geometric sequence has a 3rd term of 16 and a 5th term of 25. Find the first term and the positive common ratio of the sequence.</p> <p style="text-align: center; color: red;">$a = 10.24, d = 1.25$</p>
(d)	(e)	(f)
<p>In an arithmetic sequence, the sum of the first ten terms is 335 and the sum of the first 40 terms is 5540. Find the sum of the first 50 terms of the sequence.</p> <p style="text-align: center; color: red;">8675</p>	<p>A geometric sequence starts 2, 2.4, 2.88, ...</p> <p>Find the smallest value of n for which the sum of the first n terms is greater than 50.</p> <p style="text-align: center; color: red;">$n > 9.827.. \text{ so } n = 10$</p>	<p>The first three terms of a geometric sequence are:</p> <p style="text-align: center;">$4k, 2k + 20, k + 25$</p> <p>Given that the series converges, find the value of k and the sum to infinity of the series.</p> <p style="text-align: center; color: red;">$k = 20, S_{\infty} = 320$</p>
(g)	(h)	(i)
<p>Harriet is saving for a car. She saves £80 in the 1st month, £85 in the 2nd month, £90 in the 3rd month and so on. Work out:</p> <p>(i) how much she saves in the 15th month</p> <p>(ii) the total amount she will have saved after 2 years.</p> <p>(iii) The whole number of months required to save £10000.</p> <p style="text-align: center; color: red;">$\text{£}150, \text{£}3300, 50 \text{ months}$</p>	<p>A sequence is defined by the recurrence relation $u_{n+1} = 10 - u_n$ where $u_1 = 6$</p> <p>(i) Find u_2, u_3 and u_4</p> <p>(ii) State the period of the sequence</p> <p>(iii) Find the sum of the first 99 terms of the sequence.</p> <p style="text-align: center; color: red;">$u_2 = 4, u_3 = 6, u_4 = 4$ Period = 2 $49 \times 10 + 6 = 496$</p>	<p style="text-align: center;">Evaluate</p> $\sum_{r=5}^{16} (4r + 1 + 3^r)$ $\sum_{r=1}^{16} (4r + 1) - \sum_{r=1}^4 (4r + 1) - \sum_{r=1}^{16} 3^r + \sum_{r=1}^4 3^r$ <p style="text-align: center; color: red;">$= 560 - 44 + 64570080 - 120$ $= 64570476$</p>