

Sequences & Recurrence Relations 1 (answers)

1. (a) £373.85
(b) 16 years (15.75)
2. (a) 28 , 26.4 , 25.12 , 24.096
(b) because $-1 < a < 1$ (or equivalent)
(c) Limit = 20
3. (a) $k = \frac{1}{2}$, $c = -20$
(b) $U_4 = -33.75$
4. (a) approx. 10 hours (5×2 hours) this low value is reached before adding 12
(b) No sequence has a limit of 24 , however this is an upper value i.e. lower limit is 12 (below $12 \cdot 3$)
5. (a) 60.64 units
(b) After 3 hours the lower level climbs above 100 units this is o.k.

After a number of calculations the limit formula can be applied and the limit found (this is an upper limit since b is involved).

Limit = 254 units o.k. since well below 300 units.

Conclusion : at any time antibiotic in bloodstream will be between 154 and 254 units. This is ideal.

Sequences & Recurrence Relations 2 (answers)

1. (a) $k = 0.8$ and $c = 6$ (b) $E = 21$
2. (a) Explanation i.e. $-1 < a < 1$ (b) $L = 15$ (c) $n = 3$
3. (a) $U_2 = a(4a - 8) - 8 = 4a^2 - 8a - 8$ (b) $\therefore a = 6$ (c) $S_3 = 16 + 88 + 520 = 624$
4. (a) 72.8 units (b) 16 months .. (pupils must know to look at low value, i.e.... before adding 8)
(4 × 4)