Questions

1. Given that the complex number z and its $\bar{z}$ satisfy the equation $z\bar{z} + 2iz = 12 + 6i$. Find the possible values of z.

2. If $\frac{1}{2}\log_2 p = 3 - \log_2 q$, show that $pq^2 = 64$

3. Solve
   a) $7\log_x 3 - \log_3 x = 6$

   b) Solve $4^x + 2 = 6(2^{x-1})$

4. Solve the following inequalities
   a) $\frac{1+x}{1-x} < 1$
   b) $\left|\frac{2x-3}{x-1}\right| - 2 \le 0$

5. a) The fifth term of an arithmetic sequence is 10 and the sum of the first five terms is 30. Find the tenth term.

   b) Given $4, 2, 1, \frac{1}{2}, \ldots$, find

      i) the sum of the eight terms

      ii) the sum to infinity

Final Answers:

1. $z = 3 + 3i,\ 3 - i$
2. Kk
3. a) $x = 3, \frac{1}{2187}$ b) $x = 1, 0$
4. a) $(-\infty, 0) \cup (1, \infty)$ b) $(-\infty, 1) \cup \left[\frac{5}{4}, \infty\right)$
5. a) $T_{10} = 20$ b) i) $\frac{255}{32}$ ii) 8