9 **(a)** The first three terms of an arithmetic progression are $\ln q$, $\ln q^4$ and $\ln q^7$, where q is a positive constant. The sum to n terms of this progression is $4845 \ln q$. Find the value of n. [3]

(b) The first three terms of a geometric progression are p^{3x}, p^x and p^{-x}, where p is a positive integer. Find the nth term of this progression giving your answer in the form $p^{(a+bn)x}$. [3]

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(c) The first three terms of a different geometric progression are $\frac{4}{3}\cos^2 3\theta$, $\frac{16}{9}\cos^4 3\theta$ and $\frac{64}{27}\cos^6 3\theta$, for $0 < \theta < \frac{\pi}{3}$. Find the set of values of θ for which this progression has a sum to infinity. [5]

Question 10 is printed on the next page.