9 **(a)** The first three terms of an arithmetic progression are $\lg\theta^2$, $\lg\theta^5$ and $\lg\theta^8$.

(i) Given that the sum to n terms of this progression is $4732\lg\theta$, find the value of n. [5]

(ii) This sum is equal to -14196. Find the exact value of θ. [1]

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(b) The first three terms of a geometric progression are $\lg \phi^3$, $\lg \phi$ and $\lg \phi^{\frac{1}{3}}$.

(i) Determine whether this geometric progression has a sum to infinity. [2]

(ii) Find the nth term of this geometric progression, giving your answer in the form $3^A \lg \phi$, where A is a function of n. [3]

(iii) Find the value of ϕ, given that the 20th term is 3^{-18}. [1]

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