10 **(a)** The first 3 terms of an arithmetic progression are $2\tan 2x$, $5\tan 2x$, $8\tan 2x$. Find the values of x, where $-180° \leqslant x \leqslant 180°$, for which the sum to 30 terms is $455\sqrt{3}$. [5]

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(b) The first 3 terms of a geometric progression are

$$5\cos^2\left(\theta-\frac{\pi}{2}\right), \quad 20\cos^4\left(\theta-\frac{\pi}{2}\right), \quad 80\cos^6\left(\theta-\frac{\pi}{2}\right), \quad \text{where } -\frac{\pi}{6}\leqslant\theta\leqslant\frac{7\pi}{6}.$$

Find the values of θ for which this geometric progression has a sum to infinity. [6]

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