3 By considering the binomial expansion of $\left(z-\frac{1}{z}\right)$, where $z=\cos\theta+\mathrm{i}\sin\theta$, use de Moivre's theorem to show that

$$\operatorname{cosec}^5\theta=\frac{a}{\sin 5\theta+b\sin 3\theta+c\sin\theta},$$

where a, b and c are integers to be determined. [6]