10 Show that $\int_{\frac{\pi}{2}}^{\frac{3\pi}{2}} \left((\sin\theta+\cos\theta)^2+(\sin\theta-\cos\theta)^2\right)\mathrm{d}\theta = k\pi$, where k is an integer to be found. [5]

11 Solve the equation $(n-4)\,{}^{n+1}C_5 = {}^{n+2}C_7$. [3]

DO NOT WRITE IN THIS MARGIN