1 **(a)** Use standard results from the list of formulae (MF19) to find $\sum_{r=1}(r^3 - r)$ in terms of n, fully factorising your answer. [3]

(b) Express $\frac{r+3}{r^3-r}$ in the form $\frac{A}{r-1}+\frac{B}{r}+\frac{C}{r+1}$, where A, B and C are constants to be determined, and hence use the method of differences to find $\sum_{r=2}^{n}\frac{r+3}{r^3-r}$. [5]

(c) Deduce the value of $\sum_{r=2}^{\infty}\frac{r+3}{r^3-r}$. [1]