

Example 1 Find the r^{th} term in the expansion of $\left(x + \frac{1}{x}\right)^{2r}$.

Solution We have $T_r = {}^{2r}C_{r-1} (x)^{2r-r+1} \left(\frac{1}{x}\right)^{r-1}$

$$= \frac{|2r}{|r-1| |r+1}} x^{r+1-r+1}$$

$$= \frac{|2r}{|r-1| |r+1}} x^2$$

