

Example 8 Find the middle term in the expansion of $2ax - \frac{b}{x^2}$.

Solution Since the power of binomial is even, it has one middle term which is the

$\frac{12+2}{2}$ th term and it is given by

$$\begin{aligned} T_7 &= {}^{12}C_6 (2ax)^6 \left(\frac{-b}{x^2}\right)^6 \\ &= {}^{12}C_6 \frac{2^6 a^6 x^6 \cdot (-b)^6}{x^{12}} \\ &= {}^{12}C_6 \frac{2^6 a^6 b^6}{x^6} = \frac{59136 a^6 b^6}{x^6} \end{aligned}$$

