

Binomial Theorem Ex 18.2 Q1

$$\begin{split} T_{r+1} &= T_n = \left(-1\right)^r \, {}^{n}C_r x^{n-r} y^r \\ T_{11} &= T_{10+1} = \left(-1\right)^{10} \, {}^{25}C_{10} \left(2x\right)^{15} \left(\frac{1}{x^2}\right)^{10} = \, {}^{25}C_{10} \left(\frac{2^{15}}{x^5}\right) = \frac{25!}{10!5!} 2^{15} x^{15} \times x^{-20} \end{split}$$

 11^{th} term from the end = $(26-11+1)=16^{th}$ from beginning.

$$\Rightarrow T_{16} = T_{15+1} = (-1)^{15} \frac{25}{25} C_{15} (2x)^{10} \left(\frac{1}{x^2}\right)^{15} = \frac{-25}{25} C_{15} \frac{2^{10}}{x^{20}}$$

Binomial Theorem Ex 18.2 Q2

$$T_n = T_{r+1} = (-1)^r x^{n-r} y^r x^{10} C_r$$

$$n = 7, r = 6, x = 3x^2, y = \frac{1}{x^3}$$

$$T_7 = T_{6+1} = (-1)^6 {}^{10}C_6 (3x^2)^4 (\frac{1}{x^3})^6 = {}^{10}C_6 3^4 x^8 \times \frac{1}{x^{18}} = {}^{10}C_6 \times \frac{81}{x^{10}} = \frac{210 \times 81}{x^{10}} = \frac{17010}{x^{10}}$$

Binomial Theorem Ex 18.2 Q3

Fifth term from the end is

$$\begin{aligned} &\left(11-5+1\right)=7^{\text{th}} \text{ term from beginning} \\ &\mathcal{T}_7=\mathcal{T}_{6+1}=\left(-1\right)^{r} {}^{0}C_2x^{n-r}y^r \\ &=\left(-1\right)^{6} {}^{10}C_6\left(3x\right)^{4} \left(\frac{1}{x^2}\right)^{6}={}^{10}C_6\times 3^4\times \frac{x^4}{x^{12}}=\frac{210\times 81}{x^8}=\frac{17010}{x^8} \end{aligned}$$

Binomial Theorem Ex 18.2 Q4

$$T_N = T_{r+1} = (-1)^r {}^n C_r x^{n-r} y^r$$

$$N=8$$
, $r=7$, $x=x^{3/2}y^{1/2}$, $y=x^{1/2}y^{3/2}$, $n=10$

$$T_8 = T_{7+1} = \left(-1\right)^{7} \, {}^{10}C_7 \left(x^{3/2}y^{1/2}\right)^3 \left(x^{1/2}y^{3/2}\right)^7 = {}^{-10}C_7 x^{9/2} \times x^{7/2} \times y^{3/2}y^{21/2} = -120x^8 y^{1/2} + 120x^8 y^{1/2} + 120x^$$

Binomial Theorem Ex 18.2 Q5

$$T_N = T_{r+1} = {}^nC_rx^{n-r}y^r$$

$$N = 7$$
, $r = 6$, $n = 8$, $x = \frac{4x}{5}$, $y = \frac{5}{2x}$

$$T_7 = T_{6+1} = {}^{8}C_{6} \left(\frac{4x}{5}\right)^{2} \left(\frac{5}{2x}\right)^{6} = 28 \times \frac{4^{2}}{5^{2}} \times x^{4} \times \frac{5^{6}}{2^{6} \times x^{6}} = \frac{28}{4} \times \frac{5^{4}}{x^{4}} = \frac{7 \times 5 \times 125}{x^{4}} = \frac{4375}{x^{4}}$$

********* END ********