2.69
א1

$$T_{k+1} = \binom{12}{k}\left(x^{\frac{1}{6}}\right)^{12-k}\left(x^{-\frac{1}{2}}\right)^{k}$$

$$T_k = \binom{12}{k-1}\left(x^{\frac{1}{6}}\right)^{13-k}\left(x^{-\frac{1}{2}}\right)^{k-1}$$

$$2\left[\frac{1}{6}(12-k) - \frac{1}{2}k\right] = \frac{1}{6}(13-k) - \frac{1}{2}(k-1)$$ מתקיים

$$\frac{24-2k}{6} - k = \frac{13-k}{6} - \frac{k-1}{2} \quad / \cdot 6$$

$$24 - 2k - \cancel{6k} = 13 - k - \cancel{3k} + 3$$

$$\boxed{2 = k}$$

$$30 = \binom{12}{2} x^{\frac{10}{6}} x^{-1} - \binom{12}{1} x^{\frac{11}{6}} x^{-\frac{1}{2}}$$

$$30 = 66x^{2/3} - 12x^{4/3}$$

נסמן $t = x^{2/3}$

$$30 = 66t - 12t^2 \quad / : 6$$

$$2t^2 - 11t + 5 = 0$$

$$t = 5 \rightarrow x^{2/3} = 5 \rightarrow x = 5^{3/2}$$

$$t = \frac{1}{2} \rightarrow x^{2/3} = \frac{1}{2} \rightarrow x = \left(\frac{1}{2}\right)^{\frac{3}{2}} = 2^{-3/2}$$