3.7
4

(א) $T_{k+1} = \binom{12}{k} x^{\frac{1}{6}(12-k)} \cdot x^{-\frac{1}{2}k} = \binom{12}{k} x^{2-\frac{2}{3}k}$

$T_{k+2} = \binom{12}{k+1} x^{\frac{1}{6}(11-k)} \cdot x^{-\frac{1}{2}(k+1)} = \binom{12}{k+1} x^{\frac{8}{6}-\frac{2}{3}k}$

$2-\frac{2}{3}k = 2\left(\frac{8}{6}-\frac{2}{3}k\right)$ לפי הנתון!

$\frac{2}{3}k = \frac{2}{3} \to \boxed{k=1}$

$T_{1+1} = T_2 = \binom{12}{1} x^{2-\frac{2}{3}} = 12x^{4/3}$

$T_{1+2} = T_3 = \binom{12}{2} x^{2/3} = 66 \cdot x^{2/3}$

(ב) $12x^{4/3}+30 = 66x^{2/3}$ $/:6$ $x^{2/3}=A$

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

$A_1=5 \to x^{2/3}=5 \to x=\sqrt{125}$

$A_2=\frac{1}{2} \to x^{2/3}=\frac{1}{2} \to x=\sqrt{\frac{1}{8}}=\frac{\sqrt{2}}{\sqrt{16}}=\frac{\sqrt{2}}{4}$