

اثبت أن :

$$\frac{\binom{2n}{n}}{\binom{2n}{n}} = \binom{2n}{0} + \dots + \binom{2n}{n} + \binom{2n}{n+1} + \dots + \binom{2n}{2n}$$

الحل

$$\binom{2n}{n} = \binom{2n}{n} \times \binom{2n}{n} \quad \therefore$$

$$\binom{2n}{n} = \binom{2n}{0} + \binom{2n}{1} + \binom{2n}{2} + \dots + \binom{2n}{n-1} + \binom{2n}{n} + \binom{2n}{n+1} + \dots + \binom{2n}{2n}$$

الحد المشتتل علي س ن في المفكوك (س + ١) ن

$$ح ر = ١ + ر س$$

الحد المشتتل علي س ن في الطرف الأيمن:

$$\begin{aligned} & \binom{2n}{0} \times \binom{2n}{n} + \binom{2n}{1} \times \binom{2n}{n-1} + \binom{2n}{2} \times \binom{2n}{n-2} + \dots + \binom{2n}{n-1} \times \binom{2n}{1} + \binom{2n}{n} \times \binom{2n}{0} \\ &= \binom{2n}{0} \times \binom{2n}{n} + \binom{2n}{1} \times \binom{2n}{n-1} + \binom{2n}{2} \times \binom{2n}{n-2} + \dots + \binom{2n}{n-1} \times \binom{2n}{1} + \binom{2n}{n} \times \binom{2n}{0} \\ &= \binom{2n}{n} + \binom{2n}{n} + \binom{2n}{n} + \dots + \binom{2n}{n} + \binom{2n}{n} \end{aligned}$$

الحد المشتتل علي س ن في الطرف الأيسر:

$$\frac{\binom{2n}{n}}{\binom{2n}{n}} = \binom{2n}{n} =$$

$$\therefore \frac{\binom{2n}{n}}{\binom{2n}{n}} = \binom{2n}{0} + \dots + \binom{2n}{n} + \binom{2n}{n+1} + \dots + \binom{2n}{2n}$$