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$n=1$

$$\frac{1}{1 \cdot 3} = \frac{1 \cdot 2}{2 \cdot 3}$$

$n=k+1$

$$\frac{1}{1 \cdot 3} + \dots + \frac{k^2}{(2k-1)(2k+1)} + \frac{(k+1)^2}{(2k+1)(2k+3)} \stackrel{?}{=} \frac{(k+1)(k+2)}{2(2k+3)}$$

$$\frac{k(k+1)}{2(2k+1)} + \frac{(k+1)^2}{(2k+1)(2k+3)} \stackrel{?}{=}$$

$$\frac{k+1}{2k+1} \left[\frac{k}{2} + \frac{k+1}{2k+3} \right] = \frac{k+1}{2k+1} \left[\frac{2k^2 + 5k + 2}{2(2k+3)} \right] =$$

$$= \frac{k+1}{2k+1} \cdot \frac{(k+2)(2k+1)}{2(2k+3)} \leftarrow$$