

$$= \frac{1}{2} \left(\frac{9}{n(n+1)(2n+1)} + \frac{2}{n(n+1)} \right)$$

$$= \frac{1}{2} \left(\frac{2}{n(n+1)(2n+1)} + \frac{2}{n(n+1)} \right)$$

$$= \frac{n(n+1)(2n+1) + 2n(n+1)}{2n(n+1)(2n+1)}$$

Expanding

$$= \frac{n^2 + n(2n+1) + 2n}{2n(n+1)(2n+1)}$$

$$= \frac{2n^3 + n^2 + 2n + 2n}{2n(n+1)(2n+1)}$$

$$= \frac{2n^3 + 6n^2 + 4n}{2n(n+1)(2n+1)}$$

$$= \frac{n^3 + 3n^2 + 2n}{n(n+1)(2n+1)}$$

\therefore the result is n^3

$$= \frac{6}{n(n+1)(2n+1)}$$