

$$1) \lim_{n \rightarrow \infty} \frac{1}{n^2} = \lim_{n \rightarrow \infty} \underbrace{\frac{1}{n}}_{\rightarrow 0} \cdot \underbrace{\frac{1}{n}}_{\rightarrow 0} = \lim_{n \rightarrow \infty} \underbrace{\frac{1}{n}}_{=0} \cdot \lim_{n \rightarrow \infty} \underbrace{\frac{1}{n}}_0 = 0 \cdot 0 = 0$$

$$\lim_{n \rightarrow \infty} \frac{1}{n^3} = \lim_{n \rightarrow \infty} \underbrace{\frac{1}{n^2}}_{\rightarrow 0} \cdot \underbrace{\frac{1}{n}}_{\rightarrow 0} = 0 \cdot 0 = 0, \text{ u.s.w. : } \lim_{n \rightarrow \infty} \frac{1}{n^k} = 0$$

$$2) \lim_{n \rightarrow \infty} \left(-3 - \frac{7}{n^2} \right) = \lim_{n \rightarrow \infty} \left(-3 - 7 \cdot \underbrace{\frac{1}{n^2}}_{\rightarrow 0} \right)$$

$$= \lim_{n \rightarrow \infty} (-3) - \lim_{n \rightarrow \infty} \left(7 \cdot \frac{1}{n^2} \right) = \lim_{n \rightarrow \infty} (-3) - 7 \cdot \lim_{n \rightarrow \infty} \underbrace{\frac{1}{n^2}}_0$$

↑
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$$= -3 - 7 \cdot 0 = -3$$

$$3) \lim_{n \rightarrow \infty} \frac{4n - 3n^2}{2n^2 + 1} = \lim_{n \rightarrow \infty} \frac{n^2 \cdot \left(\frac{4}{n} - 3 \right)}{n^2 \cdot \left(2 + \frac{1}{n^2} \right)} =$$

$$= \lim_{n \rightarrow \infty} \frac{\cancel{n^2} \cdot \left(\frac{4}{n} - 3 \right)}{\cancel{n^2} \cdot \left(2 + \frac{1}{n^2} \right)} = \frac{0 - 3}{2 + 0} = -\frac{3}{2}$$