$$\lim_{n\to\infty} (a_n \pm b_n) = \lim_{n\to\infty} a_n \pm \lim b_n$$

$a_n = n \qquad b_n = 0 \qquad \lim \frac{a_n}{b_n} = \lim \frac{n}{0}$:(

$$\lim_{n\to\infty} n^2 + n + \frac{2}{n} \overset{AL}{=} \lim_{n\to\infty} n^2 + \lim_{n\to\infty} n + \lim_{n\to\infty} \frac{2}{n}$$

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

$$= \lim_{n\to\infty} n^2 + \lim_{n\to\infty} n + \lim_{n\to\infty} 2 \cdot \lim_{n\to\infty} \frac{1}{n}$$

$$= \infty + \infty + 2 \cdot 0 = \infty + \infty + 0$$

$$= \infty + 0 = \infty$$:)

$$\lim_{n\to\infty} n^3 - 2n = \lim n^3\left(1 - \frac{2}{n^2}\right)$$

faster

$$\overset{AL}{=} \lim n^3 \cdot \lim\left(1 - \frac{2}{n^2}\right)$$

How not:

$$\cancel{\overset{AL}{=}} \lim n^3 - \lim 2n = \infty - \infty$$ NOT well defined

bad using of AL thm.

$$\overset{AL}{=} \lim n^3 \left(\lim 1 - \lim \frac{2}{n^2} \right) =$$

$$= \infty \cdot (\underbrace{1 - 0}_{1}) = \underline{\underline{\infty}}$$

$$\lim \frac{-n^{8}+2n^{3}-4}{} = \lim n^{8}\left(-1+\frac{2}{n^{5}}-\frac{4}{n^{8}}\right)$$

$$= \lim n^{8} \cdot \lim \left(\qquad \right)$$

$$\lim \frac{2n^5 + 2n - 7}{n^5 - 6n^2 + 4} =$$

$$\lim \frac{\cancel{n^5}\left(2 + \frac{2}{n^4} - \frac{7}{n^5}\right)}{\cancel{n^5}\left(1 - \frac{6}{n^3} + \frac{4}{n^5}\right)} = \frac{2}{1} \checkmark$$

$$\lim_{n\to\infty} \frac{\sqrt[3]{n^2}}{n+1} = \lim_{n\to\infty} \frac{n^{2/3}}{\underbrace{n}} \cdot \frac{1}{(1+\frac{1}{n})}$$

$$\frac{1}{n^{1/3}}$$

$$= \underbrace{\lim_{n\to\infty} \frac{1}{n^{1/3}}}_{0} \cdot \frac{\lim 1}{\lim 1 + \lim \frac{1}{n}} =$$

$$0 \cdot \frac{1}{1+0} = \underline{\underline{0}}$$

$$\lim_{n\to\infty} \sqrt{n} + \sqrt{2n^2-3} =$$

$$\sqrt{\lim a_n} = \lim \sqrt{a_n}$$

$$\lim \sqrt{n} = \sqrt{\underbrace{\lim n}_{\infty}} = \sqrt{\infty}$$

$$= \infty$$

$$\to \sqrt{\underbrace{\lim n}} + \sqrt{\underbrace{\lim 2n^2 - 3}}$$

$$= \sqrt{\infty} + \sqrt{\infty}$$

$$= \infty + \infty = \underline{\underline{\infty}}$$

$$\lim \overbrace{\sqrt{2n+3}}^{A} \overset{-}{-} \overbrace{\sqrt{2n-1}}^{B}$$

$$\sqrt{\infty} - \sqrt{\infty} \quad \boxed{\text{not def.}}$$

$$\rightarrow (A^2 - B^2) = (A - B)(\underline{\underline{A + B}})$$

$$\lim \left(\overset{A}{\sqrt{2n+3}} \overset{-}{-} \overset{B}{\sqrt{2n-1}}\right) \cdot \frac{\overset{A}{\sqrt{2n+3}} \overset{+}{+} \overset{B}{\sqrt{2n-1}}}{\sqrt{2n+3}+\sqrt{2n-1}}$$

$$= \lim \frac{\cancel{2n}+3-(\cancel{2n}-1)}{\sqrt{2n+3}+\sqrt{2n-1}} = \lim \frac{4}{\sqrt{2n+3}+\sqrt{2n-1}}$$

$$= \frac{4}{\sqrt{\infty}+\sqrt{\infty}} = \frac{4}{\infty} = \underline{\underline{0}}$$