Lecture 11

✲ Questions

✲ Comparison of polynomials

$$P(x) = a_n x^n + a_{n-1} x^{n-1} + \cdots$$

$$Q(x) = b_m x^m + b_{m-1} x^{m-1} + \cdots$$

$$\lim_{x \to \infty} \frac{P(x)}{Q(x)} = \begin{cases} \dfrac{a_n}{b_m} & \text{if } m = n \\[2mm] 0 & \text{if } m > n \\[2mm] \infty & \text{if } m < n, \ \dfrac{a_n}{b_m} > 0 \\[2mm] -\infty & \text{if } m < n, \ \dfrac{a_n}{b_m} < 0 \end{cases}$$

$\underline{\underline{Ex}}$ $\displaystyle \lim_{x \to \infty} \frac{x^2}{1-x} = -\infty$

$$\lim_{x \to -\infty} \frac{\sqrt{x^2+1}}{x} = \lim_{x \to -\infty} \frac{\sqrt{x^2+1}}{-\sqrt{x^2}} = -\lim_{x \to \infty} \sqrt{1 + \frac{1}{x^2}} = -1$$

Worksheet problems ....