Math 142 – Calculus 2 Name_____
Section 7.8 Video Worksheet

Relative Rates of Growth

Rates of growth as $x \to \infty$

Let $f(x)$ and $g(x)$ be positive for x sufficiently large.

Ex. Compare e^x

$$\lim_{x\to\infty} \frac{10x^4+30x+1}{e^x} =$$

Ex. $\lim_{x\to\infty} \frac{x\ln x - x}{e^x} =$

Ex. $\lim_{x\to\infty} \frac{\sqrt{1+x^4}}{e^x} =$

Ex. $\lim_{x\to\infty} \frac{xe^x}{e^x} =$

$\lim_{x\to\infty} \frac{e^{x-1}}{e^x} =$

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A function f is of smaller order than g as $x \to \infty$ if

F is of at most the order of g as

$f = o(g)$ implies

If f and g are growing at the same rate then

Ex. $\frac{1}{x+3} = O\left(\frac{1}{x}\right)$ true or false?

Ex. $\frac{1}{x} - \frac{1}{x^2} = o\left(\frac{1}{x}\right)$ true or false?

Ex. $\sqrt{x^4 + x}, \sqrt{x^4 - x^3}$