

Quiz 23

Name: _____

Find the following limits.

1. $\lim_{x \rightarrow \infty} \frac{x^4}{e^x}$

Applying l'Hoptial's rule four times will give you $\lim_{x \rightarrow \infty} \frac{24}{e^x} = 0$.

2. $\lim_{x \rightarrow \infty} \frac{x}{\sqrt{x^2 + 1}}$

l'Hoptial's rule does not work on this problem! Instead, factor out the x^2 from the radical.

$$\lim_{x \rightarrow \infty} \frac{x}{\sqrt{x^2 + 1}} = \lim_{x \rightarrow \infty} \frac{x}{\sqrt{x^2} \sqrt{1 + \frac{1}{x}}} = \lim_{x \rightarrow \infty} \frac{1}{\sqrt{1 + \frac{1}{x}}} = 1.$$