

Some Examples

Example 1

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$$\lim_{x \rightarrow \infty} \frac{e^x}{(100).2^x} = \frac{1}{100} \lim_{x \rightarrow \infty} \left(\frac{e}{2}\right)^x = \infty$$

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$$\lim_{x \rightarrow \infty} \frac{\log_e x}{\log_2 x} = \lim_{x \rightarrow \infty} \frac{\frac{\log_2 x}{\log_2 e}}{\log_2 x} = \lim_{x \rightarrow \infty} \frac{1}{\log_2 e} =$$

Example 3

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$$\lim_{x \rightarrow \infty} \frac{x^{0.01}}{\log_e x} = \lim_{x \rightarrow \infty} \frac{(0.01)x^{-0.99}}{1/x} =$$

$$\lim_{x \rightarrow \infty} \frac{(0.01)x^{0.01}}{1} = \infty$$

Example 4

- Which of the two functions $10 \cdot e^{\log_e^2 x}$ and $x^{\log_e x}/10$ grows faster?

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- Which of the two functions $10 \cdot e^{\log_e^2 x}$ and $x^{\log_e x} / 10$ grows faster?

They grow at the same rate because, the terms $e^{\log_e^2 x}$ and $x^{\log_e x}$ are equal.