

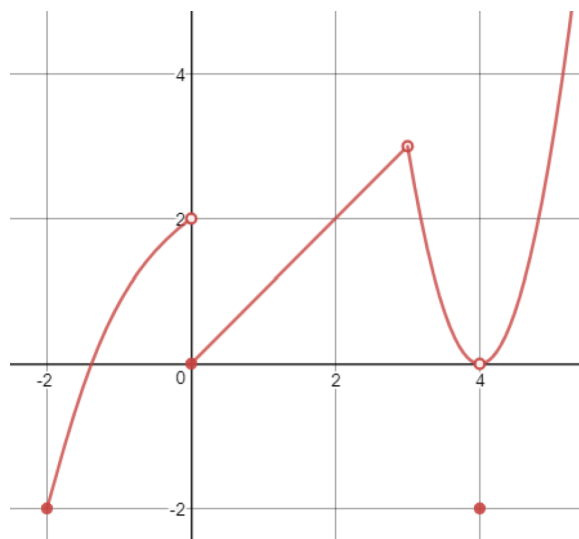
MTH 251Z Lab

Limits Involving Infinity

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Prompts

1. The graph of $y = g(t)$ is given below. Use the graph to find the following limits.



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|-------------------------------------|-------------------------------------|-------------------------------------|
| (a) $\lim_{t \rightarrow 0^-} g(t)$ | (d) $\lim_{t \rightarrow 3^-} g(t)$ | (g) $\lim_{t \rightarrow 4^-} g(t)$ |
| (b) $\lim_{t \rightarrow 0^+} g(t)$ | (e) $\lim_{t \rightarrow 3^+} g(t)$ | (h) $\lim_{t \rightarrow 4^+} g(t)$ |
| (c) $\lim_{t \rightarrow 0} g(t)$ | (f) $\lim_{t \rightarrow 3} g(t)$ | (i) $\lim_{t \rightarrow 4} g(t)$ |
2. Evaluate the following limits. Show all computational work to justify your conclusion.

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|---|---|
| (a) $\lim_{x \rightarrow \infty} \frac{2x^3 - 13x + 1}{5x^3 + x^2 + 9}$ | (d) $\lim_{x \rightarrow \infty} \frac{\sqrt{16x^2 + 1}}{2x + 7}$ |
| (b) $\lim_{x \rightarrow \infty} \frac{2x^2 - 13x + 1}{5x^3 + x^2 + 9}$ | (e) $\lim_{t \rightarrow -\infty} \frac{1 - e^t}{1 + e^t}$ |
| (c) $\lim_{x \rightarrow \infty} \frac{2x^3 - 13x + 1}{5x^2 + x + 9}$ | (f) $\lim_{t \rightarrow \infty} \frac{1 - e^t}{1 + e^t}$ |

3. Evaluate the following limits. Draw a sketch of each function to justify your conclusion.

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|--------------------------------------|---|---|--|
| (a) $\lim_{x \rightarrow 0^+} \ln x$ | (b) $\lim_{x \rightarrow \frac{\pi}{2}^-} \tan x$ | (c) $\lim_{x \rightarrow \frac{\pi}{2}} \tan x$ | (d) $\lim_{x \rightarrow 0} \frac{1}{x^2}$ |
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