MTH 251Z Lab
Limit Laws

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Prompts

1. Evaluate each limit. Justify each step by indicating which limit law(s) you used.

   (a) $\lim\limits_{t \to \pi} t$

   (b) $\lim\limits_{x \to 14} 23$

   (c) $\lim\limits_{x \to 14} x$

   (d) $\lim\limits_{t \to 4} \sqrt{6t + 1}$

   (e) $\lim\limits_{y \to 7} \dfrac{y + 3}{y - \sqrt{y + 9}}$

2. As it stands, the quotient law (of limits) cannot be used to evaluate the following limit. Explain in as much detail as possible why.
$$\lim_{h \to 0} \frac{(3 + h)^2 - 9}{h}$$

3. Evaluate each limit or show that it does not exist. Explain in as much detail as possible how to proceed from step to step.

   (a) $\lim\limits_{h \to 0} \dfrac{(3 + h)^2 - 9}{h}$

   (b) $\lim\limits_{h \to 0} \dfrac{\sqrt{3 + h} - \sqrt{3}}{h}$

   (c) $\lim\limits_{h \to 0} \dfrac{\frac{2}{x+h} - \frac{2}{x}}{h}$

   (d) $\lim\limits_{x \to -1^+} \dfrac{|x + 1|}{x^2 + 4x + 3}$

   (e) $\lim\limits_{x \to 1^-} \dfrac{|x - 1|}{x^2 - 4x + 3}$