Math 250 Chapter 1 Definitions To Know
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(1-4) State the definitions

1. $\lim_{x \to c} f(x) = L$

option 1: f(x) becomes arbitrarily close to L as x goes to c

option 2: $\forall \varepsilon > 0 \ \exists \delta > 0$ such that if $0 < |x-c| < \delta$ then $|f(x) - L| < \varepsilon$

2. f(x) is continuous at x = c.

$\lim_{x \to c} f(x) = f(c)$

3. The slope of the tangent line to y = f(x) at x = c.

$\lim_{\Delta x \to 0} \frac{f(c+\Delta x) - f(c)}{\Delta x}$

4. $\lim_{x \to c} f(x) = \infty$

option 1: f(x) becomes arbitrarily large as x goes to c

option 2:
$\forall M \ \exists \delta > 0$ such that $0 < |x-c| < \delta \Rightarrow f(x) > M$

(5-7) Give the exact value of the limits:

5. $\lim_{x \to 0} \frac{\sin(x)}{x} = 1$

6. $\lim_{x \to \pi/2} \frac{\sin(x)}{x} = \frac{\sin\left(\frac{\pi}{2}\right)}{\frac{\pi}{2}} = \frac{1}{\pi/2} = \frac{2}{\pi}$

7. $\lim_{x \to 0} \frac{1-\cos(x)}{x} = 0$