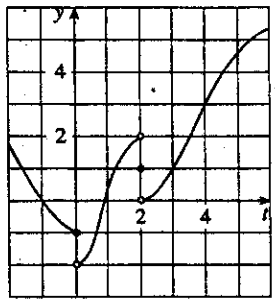
Name: Test I ID List:

1. Look at the Figure. Find (if it exists):

(a) $\lim_{x\to 4^+} f(x)$ (b) $\lim_{x\to 2^-} f(x)$ (c) $\lim_{x\to 0} f(x)$




(d) $\lim_{x\to 2^+} f(x)$ (e) $f(0)$ (f) $f(-1)$

| | | |
|---|---|---|
| $\lim_{x\to 0} \sqrt{x}\cos\frac{1}{x}$ | $\lim_{x\to 2^-} (3+\sqrt{4-x^2})$ | $\lim_{x\to 1^+} \left(\frac{1}{x-1} - \frac{1}{\lvert x-1\rvert}\right)$ |

3. Evaluate the limit, if it exists:

(a) $\lim_{x\to 1} \frac{x^3-1}{x^2-1}$

(b) $\lim_{h\to 0} \frac{(3+h)^3-27}{h}$

(c) $\lim_{x\to -3} \frac{x+3}{3-|x|}$

(b) $\lim_{t\to 0} \left(\frac{1}{t\sqrt{1+t}} - \frac{1}{t}\right)$

4. Find the limit, if it exists:

(a) $\lim_{x \to \pi/2^+} \sqrt{\frac{\cos x}{1+x}}$

(b) $\lim_{x \to 4^-} \frac{(4+\ln x)}{3x(x-4)}$

5. Prove that $\lim_{x \to 0} x^2 \cos\frac{3}{x} = 0$

6. Find an equation of the tangent line to $y = \sqrt{x+1}$ at $x = 3$

7. **Continuity**: $f(x) = \begin{cases} e^{-x} & \text{if } x < 0 \\ x^2 & \text{if } x \geq 0 \end{cases}$