3-0235 — 50 SHEETS — 5 SQUARES
3-0236 — 100 SHEETS — 5 SQUARES
3-0237 — 200 SHEETS — 5 SQUARES
3-0137 — 200 SHEETS — FILLER
COMET

22) $\lim_{h\to 0} \frac{\sqrt{1+h}-1}{h} = \lim_{h\to 0} \frac{\sqrt{1+h}-1}{h} \cdot \frac{\sqrt{1+h}+1}{\sqrt{1+h}+1}$

$= \lim_{h\to 0} \frac{1+h-1}{h(\sqrt{1+h}+1)}$

$= \lim_{h\to 0} \frac{h}{h(\sqrt{1+h}+1}$

$= \lim_{h\to 0} \frac{1}{\sqrt{1+h}+1}$

$= \frac{1}{\sqrt{1}+1} = \frac{1}{2}$

33) Show $\lim_{x\to 0} x^2 \cos 20\pi x = 0$ using Squeeze Theorem

$-1 \le \cos 20\pi x \le 1$

$-x^2 \le x^2 \cos 20\pi x \le x^2$

$\lim_{x\to 0} -x^2 = \lim_{x\to 0} x^2 = 0$

$\therefore \lim_{x\to 0} x^2 \cos 20\pi x = 0$

39) $\lim_{x\to 3} (2x + |x-3|) = \lim_{x\to 3} 2x + \lim_{x\to 3} |x-3|$

$|x-3| = \begin{cases} x-3 & x-3 \ge 0 \\ -(x-3 & x-3 < 0 \end{cases}$

$= \begin{cases} x-3 & x \ge 3 \\ 3-x & x < 3 \end{cases}$

$\lim_{x\to 3^-} 2x + \lim_{x\to 3^-} |x-3|$

$= 6 + \lim_{x\to 3^-} 3-x = 6+0 = \boxed{6}$

$\lim_{x\to 3^+} 2x + \lim_{x\to 3^+} |x-3|$

$= 6 + \lim_{x\to 3^+} x-3 = 6+0 = \boxed{6}$

$\therefore \boxed{\lim_{x\to 3} (2x + |x-3|) = 6}$

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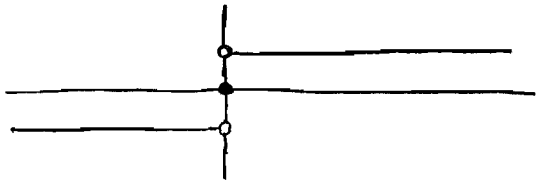
45)

$$\operatorname{sgn} x = \begin{cases} -1 & x < 0 \\ 0 & x = 0 \\ 1 & x > 0 \end{cases}$$

a.



b. $\lim_{x \to 0^+} \operatorname{sgn} x = 1$

$\lim_{x \to 0^-} \operatorname{sgn} x = -1$

$\lim_{x \to 0} \operatorname{sgn} x =$ does not exist

$\lim_{x \to 0} |\operatorname{sgn} x| = 1$ because $|\operatorname{sgn} x| = 1$ for $x \neq 0$

46)

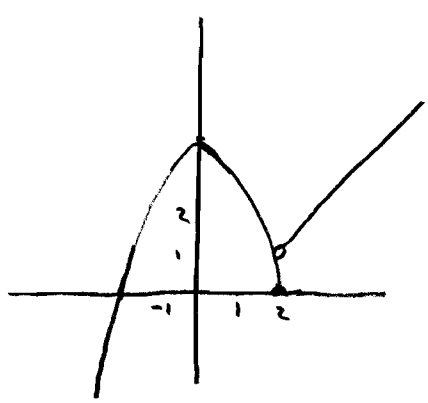
$$f(x) = \begin{cases} 4 - x^2 & x \leq 2 \\ x - 1 & x > 2 \end{cases}$$

a. $\lim_{x \to 2^-} f(x) = \lim_{x \to 2^-} 4 - x^2 = 0$

$\lim_{x \to 2^+} f(x) = \lim_{x \to 2^+} x - 1 = 1$

b. No, because the one-sided limits are not equal

c.



58) let $f(x) = \|x\|$ and $g(x) = -\|x\|$

From example 10, $\lim_{x \to 3} f(x)$ does not exist and

$\lim_{x \to 3} g(x)$ does not exist.

but, $\lim_{x \to 3} f(x) + g(x) = \lim_{x \to 3} (\|x\| - \|x\|)$

$= \lim_{x \to 3} 0 = 0$

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