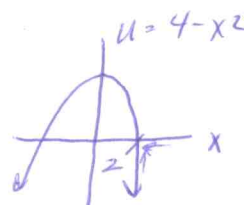


I. Find the indicated limits. If a limit does not exist indicate so by writing DNE for your answer. You must show some work to justify your answer. Clearly indicate your answers. (4 each)

(a) $\lim_{x \rightarrow 2^+} \sqrt{4-x^2} = \lim_{u \rightarrow 0^-} \sqrt{u} = \text{DNE}$

Let $u = 4 - x^2$

As $x \rightarrow 2^+$ $u \rightarrow 0^-$ } you can see this graphically:
or numerically ~~0/0~~

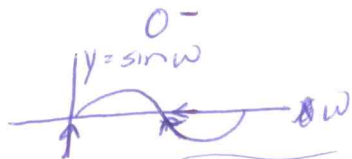


(b) $\lim_{t \rightarrow 0} \frac{\tan^2 t}{t}$

since $4 - x^2 = (2-x)(2+x)$
 $\frac{0}{0}$

$\Rightarrow \lim_{t \rightarrow 0} \left[\frac{\sin t}{t} \cdot \frac{\sin t}{\cos^2 t} \right] = \boxed{0}$

(c) $\lim_{w \rightarrow \pi^+} \frac{\frac{\pi}{w}}{\sin w} = -\infty$



(d) $\lim_{x \rightarrow 2^-} \frac{x-2}{x^2-4x+4} = \lim_{x \rightarrow 2^-} \frac{x-2}{(x-2)^2} = \lim_{x \rightarrow 2^-} \frac{1}{x-2} = -\infty$

(e) $\lim_{x \rightarrow 1} f(x)$ where $f(x) = \begin{cases} x^2 + 2, & x \geq 1 \\ x - 2, & x < 1 \end{cases}$

$\left. \begin{aligned} \lim_{x \rightarrow 1^+} f(x) &= \lim_{x \rightarrow 1^+} (x^2 + 2) = 3 \\ \lim_{x \rightarrow 1^-} f(x) &= \lim_{x \rightarrow 1^-} (x - 2) = -1 \end{aligned} \right\} \Rightarrow \lim_{x \rightarrow 1} f(x) \text{ DNE}$