Name: Richard

QUIZ 2

MATH 200
August 29, 2023

1. $\lim_{x\to 0} \frac{x}{(x-2)^2-4} = \lim_{x\to 0} \frac{x}{x^2-4x+4-4} = \lim_{x\to 0} \frac{x}{x^2-4x} = \lim_{x\to 0} \frac{x}{x(x-4)}$

getting $\frac{0}{0}$

$= \lim_{x\to 0} \frac{1}{x-4} = \frac{1}{0-4} = \boxed{-\frac{1}{4}}$

2. $\lim_{x\to 4^+} \frac{|x-4|}{8-2x} = \lim_{x\to 4+} \frac{x-4}{8-2x} = \lim_{x\to 4+} \frac{x-4}{2(4-x)} = \lim_{x\to 4+} \frac{-(4-x)}{2(4-x)}$

$4 \leftarrow x$

$x-4 > 0$

so $|x-4| = (x-4)$

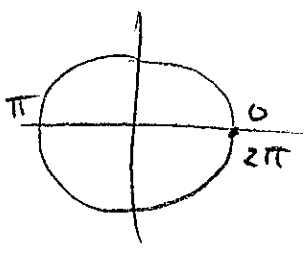
$= \lim_{x\to 4+} \frac{-1}{2} = \boxed{-\frac{1}{2}}$

3. $\lim_{x\to \frac{1}{2}} \frac{\frac{1}{x}-2}{x-\frac{1}{2}} = \lim_{x\to \frac{1}{2}} \frac{\frac{1}{x}-2}{x-\frac{1}{2}} \cdot \frac{2x}{2x} = \lim_{x\to \frac{1}{2}} \frac{2-4x}{2x^2-x}$

$= \lim_{x\to \frac{1}{2}} \frac{2(1-2x)}{x(2x-1)} = \lim_{x\to \frac{1}{2}} \frac{-2(2x-1)}{x(2x-1)} = \lim_{x\to \frac{1}{2}} \frac{-2}{x}$

$= \frac{-2}{1/2} = \boxed{-4}$

4. $\lim_{x\to 2\pi} \cos(x) = \cos(2\pi) = \boxed{1}$



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1. $\lim_{h\to 0} \frac{(h-1)^2-1}{h} = \lim_{h\to 0} \frac{h^2-2h+1-1}{h} = \lim_{h\to 0} \frac{h^2-2h}{h}$

$= \lim_{h\to 0} \frac{h(h-2)}{h} = \lim_{h\to 0} (h-2) = 0-2 = -2$

$= \boxed{-2}$

2. $\lim_{x\to 2} \frac{\sqrt{2x}-2}{x-2} = \lim_{x\to 2} \frac{\sqrt{2x}-2}{x-2} \cdot \frac{\sqrt{2x}+2}{\sqrt{2x}+2}$

$= \lim_{x\to 2} \frac{\sqrt{2x}^2 + 2\sqrt{2x} - 2\sqrt{2x} - 4}{(x-2)(\sqrt{2x}+2)} = \lim_{x\to 2} \frac{2x-4}{(x-2)(\sqrt{2x}+2)}$

$= \lim_{x\to 2} \frac{2(x-2)}{(x-2)(\sqrt{2x}+2)} = \lim_{x\to 2} \frac{2}{\sqrt{2x}+2} = \frac{2}{\sqrt{2\cdot 2}+2} = \frac{2}{4} = \boxed{\frac{1}{2}}$

3. $\lim_{x\to 4^-} \frac{|x-4|}{8-2x} = \lim_{x\to 4^-} \frac{4-x}{2(4-x)} = \lim_{x\to 4^-} \frac{1}{2} = \boxed{\frac{1}{2}}$

0 $x\to 4$

$x-4 < 0$

so $|x-4| = -(x-4) = 4-x$

4. $\lim_{x\to \pi} \cos(x) = \cos(\pi) = \boxed{-1}$