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

26) Discuss continuity:

$x = -1$ Discontinuity

28) Discuss continuity:

$x = 1$ discontinuity

10) $\lim_{x\to 4^-} \dfrac{\sqrt{x}-2}{x-4} \cdot \dfrac{\sqrt{x}+2}{\sqrt{x}+2}$

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

$\lim_{x\to 4^-} \dfrac{1}{\sqrt{x}+2} = \dfrac{1}{\sqrt{4}+2} = \dfrac{1}{4}$

12) $\lim_{x\to 2^+} \dfrac{|x-2|}{x-2} = 1$ ←

x	3	4
y	1	1

$\dfrac{|3-2|}{3-2} = \dfrac{1}{1}$

46) Where discontinuous? Is it removable?

$$f(x)=\begin{cases}-2x+3, & x<1\\ x^2, & x\geq 1\end{cases}$$

$f(1) = -2(1)+3 = 1$

$f(1) = (1)^2 = 1$

Continuous

62) Discuss continuity: $f(g(x))$

$$f(x)=\frac{1}{\sqrt{x}} \quad \text{and} \quad g(x)=x-1$$

$$\frac{1}{\sqrt{x-1}}$$

$x-1>0$

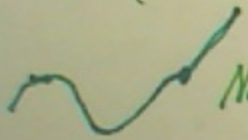
$+1 \quad +1$

$x>1$

Continuous

68) Where discontinuous?
(Use graphing calculator)

$$f(x)=\begin{cases}\cos x-1, & x<0\\ 5x, & x\geq 0\end{cases}$$

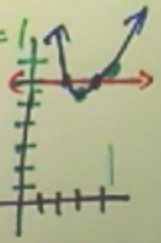


No where

86) Verify IVT. Find c.

$$f(x)=\frac{x^2+x}{x-1},\ \left[\tfrac{5}{2},4\right],\ f(c)=6$$

Continuous on interval $[\frac{5}{2},4]$ all but $x=1$



$$f\left(\tfrac{5}{2}\right)=\frac{\left(\frac{5}{2}\right)^2+\frac{5}{2}}{\frac{5}{2}-1}=5\tfrac{5}{6}$$

$$f(4)=\frac{(4)^2+4}{4-1}=6\tfrac{2}{3}$$

IVT applies

$$\frac{x^2+x}{x-1}=\frac{6}{1}$$

$$x^2+x=6x-6$$

$$x^2-5x+6=0$$

$$(x-3)(x-2)=0$$

$x=3$ & 2

$\boxed{c=3}$

32) Discuss the discontinuity

$f(x) = \dfrac{\sin(x+1)}{x+1}$ $\quad x+1=0$, $-1\ \ -1$

$x=-1$ Hole

$f(-1) = \dfrac{\sin(-1+1)}{-1+1} = \dfrac{0}{0}$

$\lim_{x\to 0} \dfrac{\sin x}{x} = 1$

44) $\lim_{x\to \pi/2^+} \left(\dfrac{-2}{\cos x}\right) = \dfrac{-2}{\cos\left(\frac{\pi}{2}\right)} = \dfrac{-2}{0}$

Vertical asymptote

X	$\frac{2\pi}{3}$	$\frac{3\pi}{4}$
Y	$\frac{-2}{\cos\frac{2\pi}{3}} = \frac{-2}{-\frac{1}{2}}$	$\frac{-2}{\cos\left(\frac{3\pi}{4}\right)} = \frac{-2}{-\frac{\sqrt{2}}{2}}$

4 $\quad \infty$

$\frac{4}{\sqrt{2}} = \frac{4\sqrt{2}}{2}$

$2\sqrt{2}$