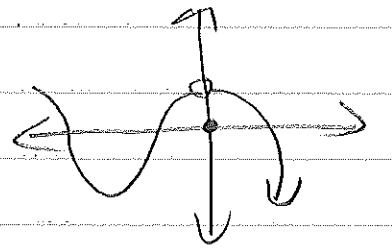
Sec 2.4 day 2 page 122 (17, 19, 20, 22, 28, 33, 35, 41, 42, 51)

(17) $$s(x) = \begin{cases} \cos x & \text{if } x < 0 \\ 0 & \text{if } x = 0 \\ 1 - x^2 & \text{if } x > 0 \end{cases}$$



$\lim_{x \to 0} s(x) = DNE$ not cont at 0

(19) $R(x) = x^2 + \sqrt{2x-1}$

$x^2 \to$ poly thm 7, thm 4

$\sqrt{2x-1} \to$ root

$D: x \geq \frac{1}{2} \Rightarrow [\frac{1}{2}, \infty)$

(20) $G(x) = \sqrt[3]{x}(1+x^3) = \sqrt[3]{x} + x^{10/3}$

$\sqrt[3]{x} \to$ root

$\sqrt[3]{x^{10}} \to$ root thm 7, thm 4

$x^{10} \to$ poly

$D = (-\infty, \infty)$

(22) $h(x) = \dfrac{\sin x}{x+1}$

$\sin x \to$ trig

$x+1 \to$ quad poly thm 7, thm 4

$\dfrac{\sin x}{x+1} \to$ rational

$D = (-\infty, -1) \cup (-1, \infty)$

(28) $\lim_{x \to \pi} \sin(x + \sin x)$ $\Rightarrow$ cont $\mathbb{R}$

$= \sin(\pi + \sin \pi)$

$= \sin(\pi + 0)$

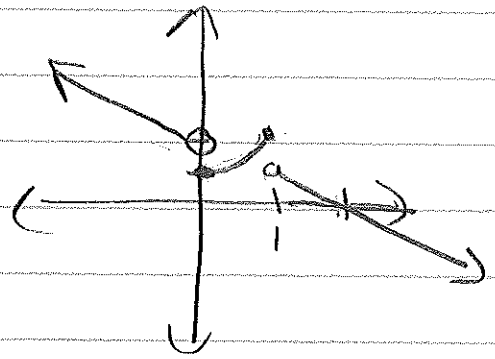
$= \sin \pi$

$= 0$

(33) discon at $x=0$ and $x=1$

$x=0$ con right

$x=1$ con left



(39) $cx^2 + 2x \qquad x = 2$

$x^3 - cx$

$c(4) + (4) = 8 - c(2)$

$4c + 4 = 8 - 2c$

$6c = 4$

$\boxed{c = 2/3}$

(41) $f(1) = -1$

$f(2) = 15$ $\therefore$ by IVT $\exists\, x$ s.t. $f(x) = 0$.

(42) $1 - x - \sqrt[3]{x} = 0$

$f(0) = 1$ $\therefore$ by IVT $\exists\, x$ s.t. $f(x) = 0$.

$f(1) = -1$