

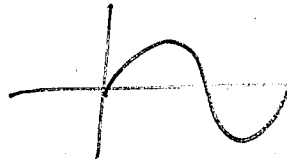
2.3

37) $y = \frac{1}{\sqrt{x+2}}$

$y=1$
 $y=2$

$y = \sqrt{x}$
 $y = \sqrt{x+2}$

45) $x = x^9 - 1$



27) $f(x) = \frac{\sin x}{x}, x=0$

$\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$

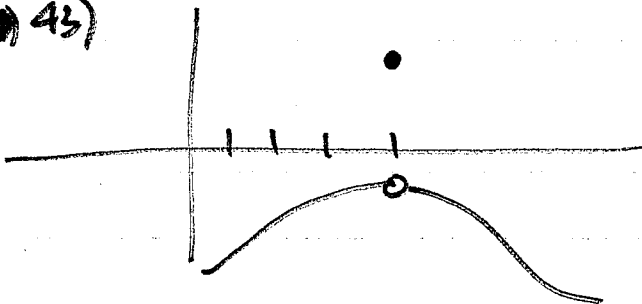
$g(x) = \begin{cases} \frac{\sin x}{x}, & x \neq 0 \\ 1, & x = 0 \end{cases}$

31) $f(x) = \frac{1}{x-3}$

$y=1$

$y=x-3$

43)



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

$x=2$ NOT REMOVABLE

29) $f(x) = \frac{x-4}{\sqrt{x}-2} = \frac{(\sqrt{x})^2 - 2^2}{\sqrt{x}-2} = \frac{(\sqrt{x}+2)(\sqrt{x}-2)}{\sqrt{x}-2}$

2.3

51) $e^{-x} = x$
 $e^{-x} - x = 0$

$$\lim_{x \rightarrow -\infty} e^{-x} - x = \infty$$

$$\lim_{x \rightarrow \infty} e^{-x} - x = -\infty$$

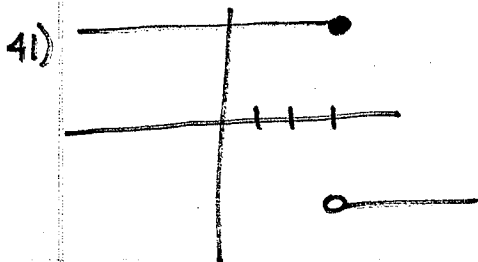
3) $y = \frac{1}{x^2 + 1}$

$$x^2 + 1 = 0$$
$$x^2 = -1$$

39) $y = |x^2 - 4x|$

$$y = |x|$$

$$y = x^2 - 4x$$



49) $f(x) = \begin{cases} 4 - x^2, & x < -1 \\ ax^2 - 1, & x \geq -1 \end{cases}$

$$4 - (-1)^2 = a(-1)^2 - 1 \leftarrow$$
$$3 = a - 1$$
$$+1 \quad +1$$

$$4 = a$$

2.3

LHE #74

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

$f(x)$ IS CONTINUOUS ON $\left[\frac{5}{2}, 4 \right]$, ITS ONLY DISCONTIN. IS AT $x=1$ WHICH IS OUTSIDE THE INTERVAL.

$$f\left(\frac{5}{2}\right) = \frac{\left(\frac{5}{2}\right)^2 + \frac{5}{2}}{\frac{5}{2} - 1} = \frac{\frac{25}{4} + \frac{5}{2}}{\frac{3}{2}} = \frac{\frac{25}{4} + \frac{10}{4}}{\frac{3}{2}} = \frac{\frac{35}{4}}{\frac{3}{2}} = \frac{35}{4} \cdot \frac{2}{3} = \frac{35}{6}$$

$$f(4) = \frac{4^2 + 4}{4 - 1} = \frac{16 + 4}{3} = \frac{20}{3} \quad 6.$$

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

$$0.4 = 7.0$$

$$0 = 0$$

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

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

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

$$\cancel{x=2}, \underline{x=3}$$

$$c = 3$$

2.3

$$17) f(x) = \begin{cases} x^2 - 1, & x < 3 \\ 2ax, & x \geq 3 \end{cases}$$

$$3^2 - 1 = 2a(3)$$

$$\frac{8}{6} = \frac{6a}{6}$$

$$\frac{4}{3} = a$$

$$29) f(x) = \frac{x-4}{\sqrt{x-2}} = \frac{(\sqrt{x})^2 - (2)^2}{\sqrt{x-2}} = \frac{(\sqrt{x}-2)(\sqrt{x}+2)}{\sqrt{x-2}} = \sqrt{x}+2$$

$$19) f(x) = \begin{cases} 3-x, & x < 2 \\ \frac{x}{2} + 1, & x \geq 2 \end{cases}$$

$$3-2 = 1$$

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

