(25) $y = \dfrac{x}{4-x^2}$

a) y-intercept : $x=0$ $\quad y = \dfrac{0}{4-0} = 0$ $\quad (0,0)$

x-intercept : $y=0$ $\quad 0 = \dfrac{x}{4-x^2}$

$0 = x$ $\quad (0,0)$

$\boxed{(0,0) \text{ is the only intercept}}$

b) $4-x^2=0$

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

$x = 2, -2$

$\boxed{x=2 \text{ and } x=-2 \text{ are vertical asymptotes}}$

$$\lim_{x\to\pm\infty} \frac{x}{4-x^2}$$

$$= \lim_{x\to\pm\infty} \frac{\frac{x}{x^2}}{\frac{4}{x^2} - \frac{x^2}{x^2}}$$

$$= \lim_{x\to\pm\infty} \frac{\frac{1}{x}}{\frac{4}{x^2} - 1}$$

$$= \frac{0}{0-1}$$

$$= 0$$

$\boxed{\begin{array}{l} y=0 \text{ is a horizontal asymptote} \\ \text{No slant asymptote.} \end{array}}$

c) $$f'(x) = \frac{(4-x^2)(1) - x(-2x)}{(4-x^2)^2}$$

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

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

d) Critical points : $f'(x) = 0$

or $f'(x)$ undefined

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

$$x^2+4 = 0$$

no solution

$\frac{x^2+4}{(4-x^2)^2}$ undefined

when $(4-x^2)^2 = 0$

$$(2-x)^2(2+x)^2 = 0$$

$$x = 2, -2$$

		-2		2	
$f'(x)$	$+$		$+$		$+$

$\boxed{\text{No Relative Maximum or Relative Minimum Points}}$

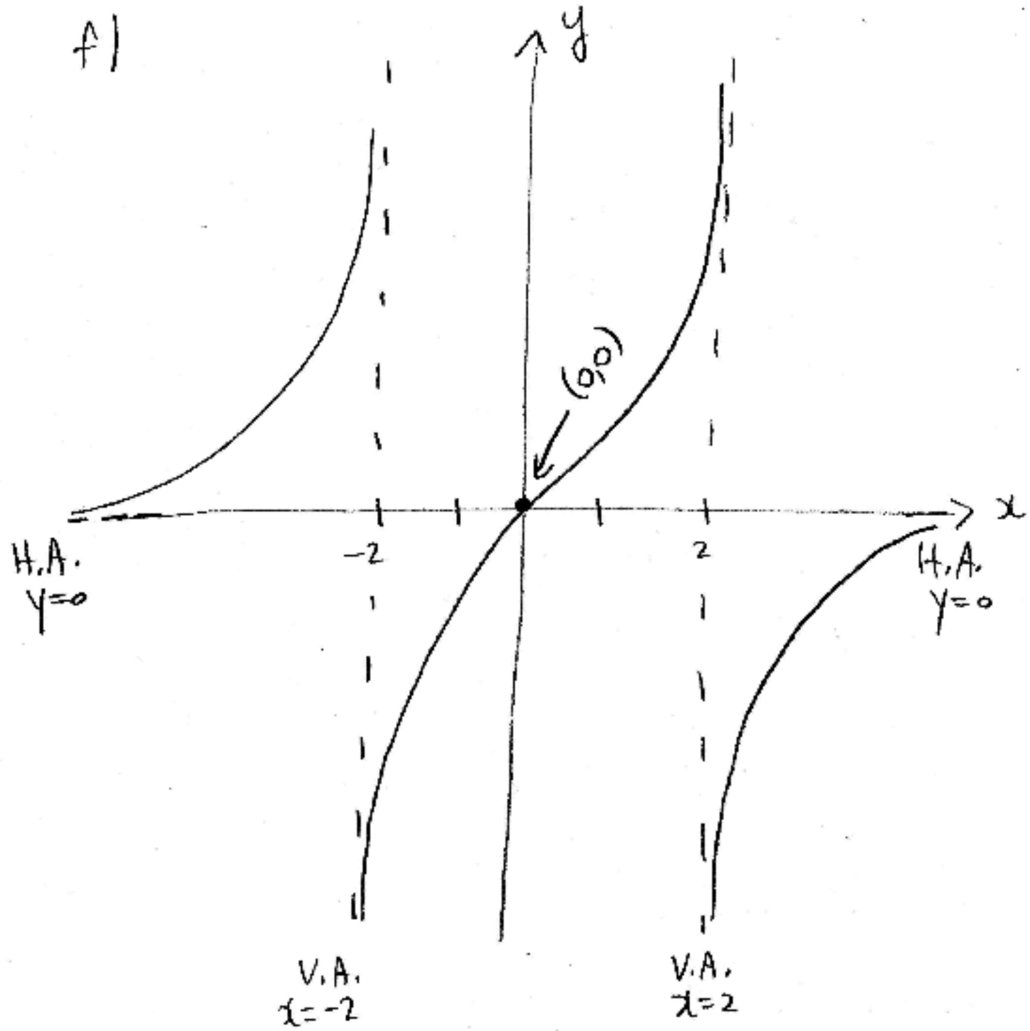
e) $f(x)$ is increasing on:

$-\infty < x < -2$

$-2 < x < 2$

and $2 < x < \infty$

f)



(26) $\sin(xy) + \cos(2y) = x^2$

Take $\frac{d}{dx}$:

$$\cos(xy)\,\frac{d}{dx}[xy] - \sin(2y)\left[2\,\frac{dy}{dx}\right] = 2x$$

$$\cos(xy)\left[x\frac{dy}{dx} + y(1)\right] - 2\sin(2y)\frac{dy}{dx} = 2x$$

$$x\cos(xy)\frac{dy}{dx} + y\cos(xy) - 2\sin(2y)\frac{dy}{dx} = 2x$$

$$x\cos(xy)\frac{dy}{dx} - 2\sin(2y)\frac{dy}{dx} = 2x - y\cos(xy)$$

$$[x\cos(xy) - 2\sin(2y)]\frac{dy}{dx} = 2x - y\cos(xy)$$

$$\frac{dy}{dx} = \frac{2x - y\cos(xy)}{x\cos(xy) - 2\sin(2y)}$$

(27) $y = \dfrac{3(e^{2x} - e^{-2x})}{e^{2x}}$

SIMPLIFY! $y = 3(1 - e^{-4x})$

$y' = 3(0 - e^{-4x}(-4))$

$y' = 3(4e^{-4x})$

or $y' = 12e^{-4x}$