

CALCULO APLICADO
PRUEBA N° 1
(Solución)

1.

$$a) 1 + \frac{6}{(x+2)(x+1)} - \frac{6}{x+2} > 0 \Leftrightarrow \frac{(x+2)(x+1) + 6 - 6(x+1)}{(x+2)(x+1)} > 0 \Leftrightarrow$$

$$\frac{x^2 - 3x + 2}{(x+2)(x+1)} > 0 \Leftrightarrow \frac{(x-2)(x-1)}{(x+2)(x+1)} > 0$$

	-2	-1	1	2	
X+2	-	+	+	+	+
X+1	-	-	+	+	+
X-1	-	-	-	+	+
X-2	-	-	-	-	+
	*		*		*

$$S = (-\infty, -2) \cup (-1, 1) \cup (2, \infty)$$

$$b) \text{ Como } \left(\frac{1}{\sqrt{a}} - \sqrt{a} \right)^2 \geq 0 \Leftrightarrow \frac{1}{a} + a - 2 \geq 0 \Rightarrow \frac{1}{a} + a \geq 2$$

2.

$$a) \text{ Si } y = \frac{3x}{x-5} \Rightarrow (x-5)y = 3x \Rightarrow x(y-3) = 5y$$

$$\therefore x = \frac{5y}{y-3}; \quad f^{-1}(x) = \frac{5x}{x-3}$$

$$b) \text{ Si } y = \frac{2x+1}{x} \Rightarrow xy = 2x+1 \Rightarrow x(y-z) = 1$$

$$\therefore x = \frac{1}{y-2}; \quad (g, f)(x) = \frac{1}{x+2}$$

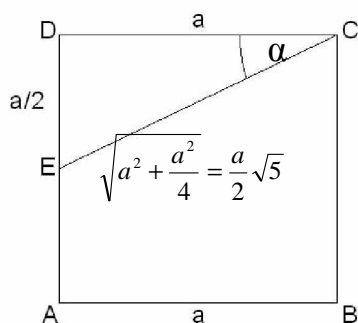
$$c) f^{-1}, g^{-1} = \frac{2x+1}{x} \Leftrightarrow f^{-1}(g^{-1}(x)) = \frac{2x+1}{x} = \frac{5g^{-1}}{g^{-1}-3} \Leftrightarrow (2x+1)(g^{-1}-3) = 5xg^{-1}$$

$$g^{-1}(x)(1-3x) = 3(2x+1) \Rightarrow g^{-1}(x) = \frac{6x+3}{1-3x}$$

$$\text{Si } y = \frac{6x+3}{1-3x} \Rightarrow y(1-3x) = 6x+3 \Rightarrow x(-3y-6) = 3-y$$

$$x = \frac{y-3}{3(y+2)}; \quad \therefore g(x) = \frac{x-3}{3(x+2)}$$

3.



$$\text{sen}\alpha = \frac{\frac{a}{2}}{\frac{a}{2}\sqrt{5}} = \frac{\sqrt{5}}{5} \quad \text{cos}\alpha = \frac{a}{\frac{a}{2}\sqrt{5}} = \frac{2\sqrt{5}}{5}$$

4.

$$\text{Tg}\alpha + \text{Sec}\alpha = \frac{\text{sen}\alpha}{\text{cos}\alpha} + \frac{1}{\text{cos}\alpha} = \frac{\text{sen}\alpha + 1}{\text{cos}\alpha} = \frac{\text{sen}\alpha + 1}{\sqrt{1 - \text{sen}^2\alpha}} = 2$$

$$\text{sen}\alpha + 1 = 2\sqrt{1 - \text{sen}^2\alpha} \Rightarrow \text{sen}^2\alpha + 2\text{sen}\alpha + 1 = 4 - 4\text{sen}^2\alpha$$

$$5\text{sen}^2\alpha + 2\text{sen}\alpha - 3 = 0$$

$$\text{sen}\alpha = \frac{-2 \pm \sqrt{4 + 60}}{10} = \frac{-2 \pm 8}{10}$$

$$\text{sen}\alpha = -1 \wedge \text{sen}\alpha = \frac{3}{5}$$