P1

viernes, mayo 31, 2019 9:51 PM

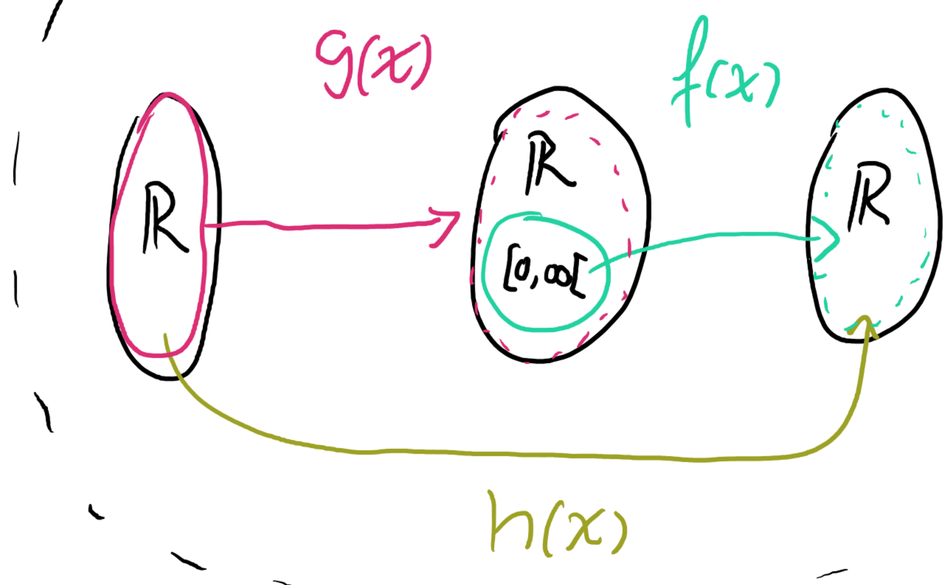
P1

i) Sea $h : Dom(g) \longrightarrow Codom(f)$

$x \longrightarrow h(x) = f \circ g(x)$

$f \circ g(x) = f(g(x)) = f(2x-1) = (2x-1)^2 + 1$

$= 4x^2 - 4x + 1 + 1 = 4x^2 - 4x + 2$



ii) Notamos que $g(0) = 2(0) - 1 = -1$

y que $-1 \notin Dom(f) = [0, \infty^+[$

$\therefore \nexists\, h(0)$

iii) Para que $h(x)$ exista, $x \in Dom(g)$

$\wedge\ g(x) \in Dom(f)$

$\therefore x \in \mathbb{R}$ R1

$-2x + 1 \in [0, \infty[$

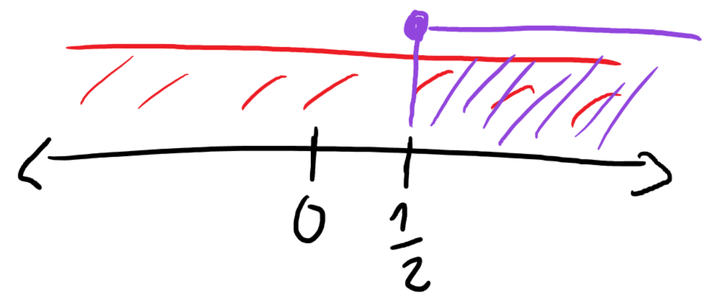
$\iff 2x + 1 \geq 0 \quad / -1$

$2x \geq -1 \quad / \cdot \frac{1}{2} > 0$

$x \geq \frac{1}{2}$ R2

finalmente $R1 \cap R2 = x \geq \frac{1}{2}$

$x \in [\frac{1}{2}, \infty^+[$



P2

viernes, mayo 31, 2019 10:24 PM

P2)

i) necesitamos escribir $f(x) = -3x^2 - 12x - 11$ de la forma $a(x-h)^2 + k$ $(ax^2 + bx + c)$

tenemos a directo: $a = -3$

para h, ocupamos $h = \frac{-b}{2a}$

$h = \frac{-(-12)}{2(-3)} = \frac{12}{-6} = -2$

y para k, $k = f(h)$, (que $\exists \because -2 \in Dom(f)$)

$k = -3(-2)^2 - 12(-2) - 11 = -12 + 24 - 11 = 1$

finalmente: $f(x) = -3(x+2)^2 + 1$

---

ii) $y = f(x)$

$\Leftrightarrow y = -3(x+2)^2 + 1 \quad / -1$

$\Leftrightarrow y - 1 = -3(x+2)^2 \quad / \cdot -\frac{1}{3}$

$\frac{1-y}{3} = (x+2)^2 \quad / \sqrt{(\,)}$

$\sqrt{\frac{1-y}{3}} = |x+2| \quad /$ → notamos que $x \geq -2$ por $Dom(f)$

$\therefore x + 2 \geq 0$

$\sqrt{\frac{1-y}{3}} = x+2 \quad / -2 \quad \therefore |x+2| = x+2$

$x = \sqrt{\frac{1}{3} - \frac{y}{3}} - 2$

finalmente $f^{-1}(y) = \sqrt{\frac{1}{3} - \frac{1}{3}} - 2$

---

iii) $Dom(f^{-1}) = Codom(f) =]\infty, 1]$

$Codom(f^{-1}) = Dom(f) = [-2, \infty[$

$(f^{-1} \circ f)(x) = id_{[-2,\infty[}(x) = x, \forall x \in [-2, \infty[$

$(f \circ f^{-1})(y) = id_{]\infty,1]}(x) = x, \forall x \in]\infty, 1] = Dom(f^{-1})$

---

iv) Graf. de $f(x)$, nos conviene saber $f(0)$:

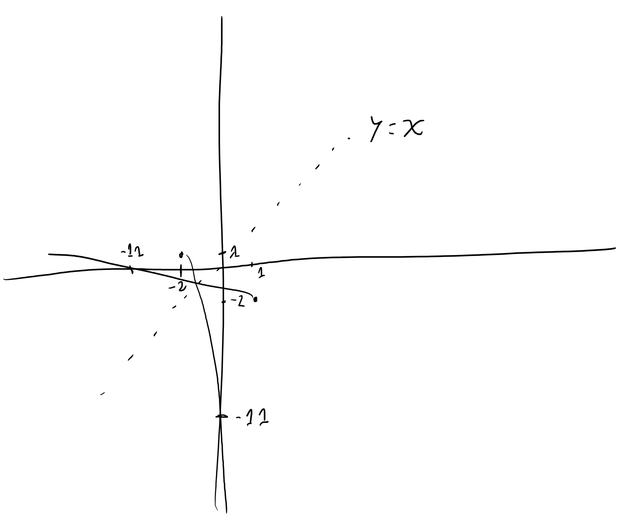
$f(0) = -3(0+2)^2 + 1$

$= -3(4) + 1$

$= -12 + 1$

$= -11$

Graficamos f y deducimos f^{-1}



P3

viernes, mayo 31, 2019 11:31 PM

Regla mnemotecnica

	0°	30°	45°	60°	90°
sen	0	1	2	3	4
cos	4	3	2	1	0

$\frac{\sqrt{\quad}}{2}$

ángulos $\rightleftharpoons$ rad

$rad = \frac{grad \cdot \pi}{180}$

$grad = \frac{rad \cdot 180}{\pi}$

(regla de 3, sabiendo $360° : 2\pi \cdot \frac{1}{2}$, $180° : \pi$)

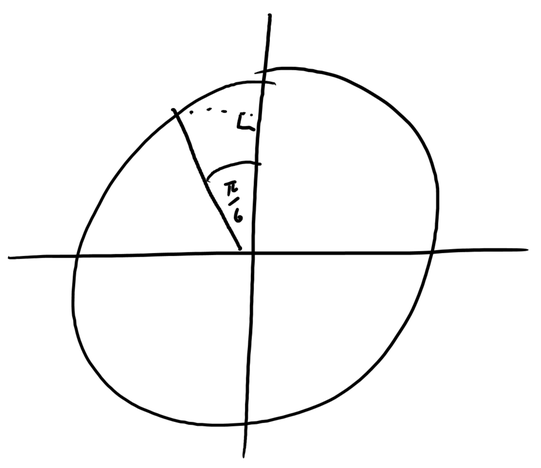
$\frac{grad}{180°} = \frac{rad}{\pi}$

Con esta info llenamos la tabla desde 0 a π (90°)

grad	rad	sen	cos
0°	0	0	1
30°	$\pi/6$	$1/2$	$\sqrt{3}/2$
45°	$\pi/4$	$\sqrt{2}/2$	$\sqrt{2}/2$
60°	$\pi/3$	$\sqrt{3}/2$	$1/2$
90°	$\pi/2$	1	0

Para los siguientes valores usaremos $\triangle$ unitario:

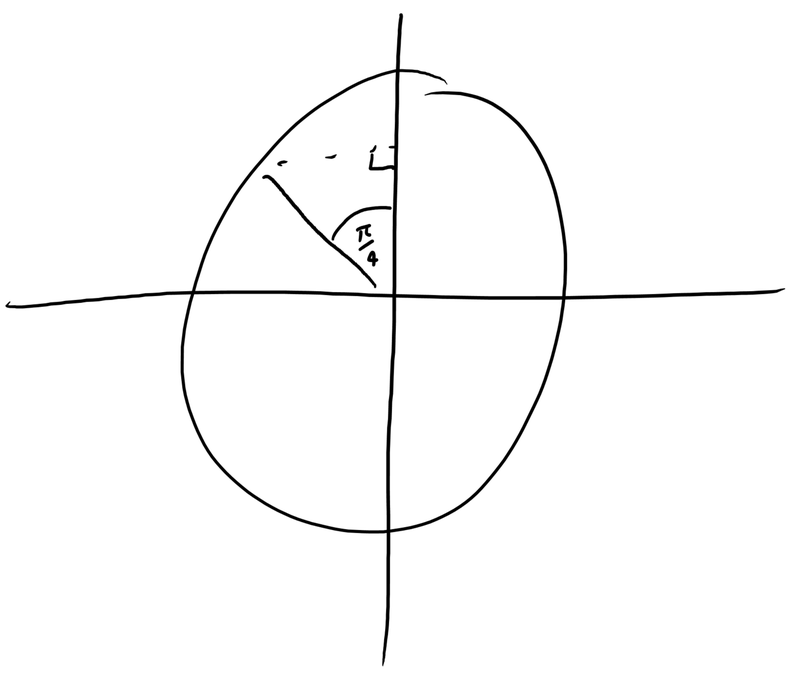
$\alpha = 120° = \frac{2\pi}{3} = \frac{\pi}{2} + \frac{\pi}{6}$



$sen(\alpha) = cos(\frac{\pi}{6}) = \frac{\sqrt{3}}{2}$

$cos(\alpha) = sen(\frac{\pi}{6}) = \frac{1}{2}$

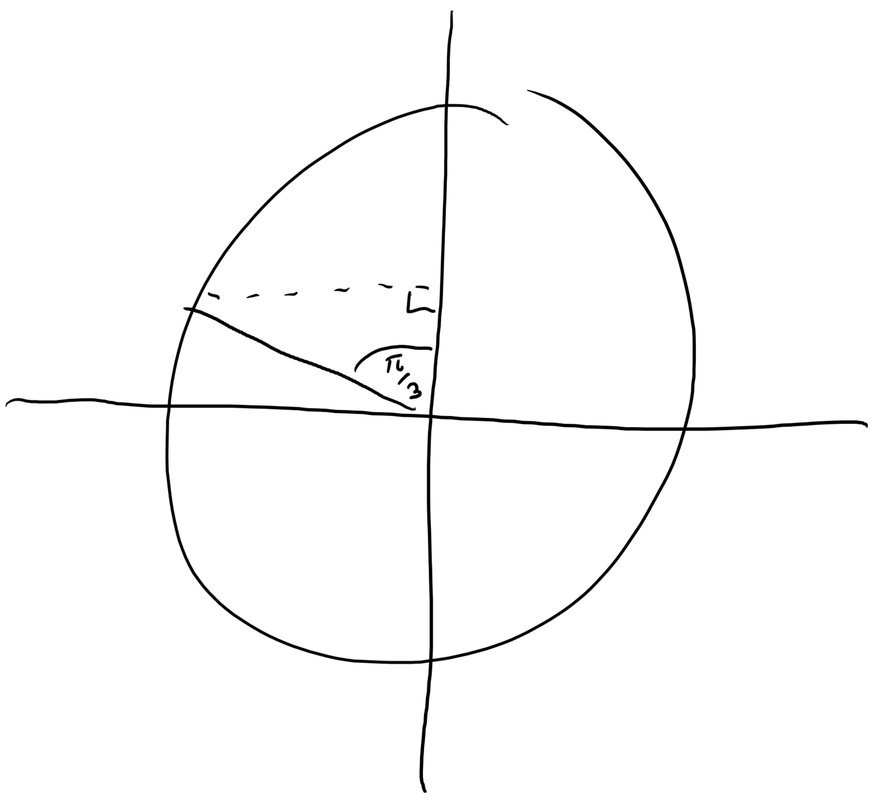
$\alpha = 135° = \frac{3\pi}{4} = \frac{\pi}{2} + \frac{\pi}{4}$



$sen(\alpha) = cos(\frac{\pi}{4}) = \frac{\sqrt{2}}{2}$

$cos(\alpha) = sen(\frac{\pi}{4}) = \frac{\sqrt{2}}{2}$

$\alpha = \frac{5\pi}{6} = 150° = \frac{\pi}{2} + \frac{\pi}{3}$



$sen(\alpha) = cos(\pi/3) = 1/2$

$cos(\alpha) = sen(\pi/3) = \frac{\sqrt{3}}{2}$