

FUNCIONES

Ejercicio 1.- Calcular el dominio de las siguientes funciones:

a. $f(x) = 9 - 4x^2$	$Dom f = R$	k. $g(x) = \sqrt[4]{x^2 + 5x + 8}$	$Dom g = R$
b. $g(x) = \frac{x}{7 - x^2}$	$Dom g = R - \{\sqrt{7}, -\sqrt{7}\}$	l. $l(x) = \sqrt{3 + 2x - x^2}$	$Dom l = [-1, 3]$
c. $h(x) = \frac{x-1}{x^3 - 2x^2 - 5x + 6}$	$Dom h = R - \{-2, 1, 3\}$	m. $m(x) = \frac{\sqrt{9-x^2}}{x+1}$	$Dom m = [-3, 3] - \{-1\}$
d. $y = 1 + \frac{1}{x} - \frac{x}{x-1}$	$Dom y = R - \{0, 1\}$	n. $y = e^{\frac{1}{x}} + 2^{-\frac{1}{x-7}}$	$Dom y = R - \{0, 7\}$
e. $f(x) = \sqrt[5]{\frac{x}{7-x^2}}$	$Dom f = R - \{\sqrt{7}, -\sqrt{7}\}$	ñ. $\tilde{n}(x) = \ln(2x+3)$	$Dom \tilde{n} = \left(-\frac{3}{2}, +\infty\right)$
f. $f(x) = x - \frac{2}{\sqrt{x}}$	$Dom f = (0, +\infty)$	o. $k(x) = \ln(2x+3) + \frac{1}{x}$	$Dom k = \left(-\frac{3}{2}, +\infty\right) - \{0\}$
g. $y = \sqrt{x^2 - 5x + 6}$	$Dom y = (-\infty, 2] \cup [3, +\infty)$	p. $f(x) = \text{sen}\sqrt{1-x^2}$	$Dom f = [-1, 1]$
h. $y = \frac{-2}{\sqrt{x^2 - 5x + 6}}$	$Dom y = (-\infty, 2) \cup (3, +\infty)$	q. $f(x) = x^2 - 3x + \ln 5^{\cos x}$	$Dom f = R$
i. $y = \frac{-2}{\sqrt[7]{x^2 - 5x + 6}}$	$Dom y = R - \{2, 3\}$	r. $h(x) = \frac{\log(25-x^2)}{\sqrt{x^2+3x-4}}$	$Dom h = (-5, -4) \cup (1, 5)$
j. $f(x) = \sqrt{\frac{x+2}{3x-5}}$	$Dom f = (-\infty, -2] \cup \left(\frac{5}{3}, +\infty\right)$	s. $y = \text{tg}(2x-3)$	$Dom f = R - \left\{\frac{3}{2} + (2k+1)\frac{\pi}{4} \text{ con } k \in \mathbb{Z}\right\}$

Ejercicio 2.- Dadas las funciones: $f(x) = \frac{1-x}{3x+1}$, $g(x) = \sqrt{x+2}$ y $h(x) = e^{2x-6}$, calcular:

- a) Sus dominios b) $f \circ g$ c) $g \circ h$ d) $g \circ g$ e) f^{-1} f) g^{-1} g) h^{-1} h) $f^{-1} \circ g$

SOL:

$$\begin{array}{llll} \text{a) } \text{Dom } f = R - \left\{ -\frac{1}{3} \right\} & \text{Dom } g = [-2, +\infty) & \text{Dom } h = R & \text{b) } (f \circ g)(x) = \frac{1 - \sqrt{x+2}}{3\sqrt{x+2} + 1} \\ \text{c) } (g \circ h)(x) = \sqrt{e^{2x-6} + 2} & & & \\ \text{d) } (g \circ g)(x) = \sqrt{\sqrt{x+2} + 2} & \text{e) } f^{-1}(x) = \frac{1-x}{3x+1} & \text{f) } g^{-1}(x) = x^2 - 2 & \text{g) } h^{-1}(x) = \frac{1}{2}(\ln x + 6) \\ \text{h) } (f^{-1} \circ g)(x) = \frac{1 - \sqrt{x+2}}{3\sqrt{x+2} + 1} & & & \end{array}$$