

FUNCIONES

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

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

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:

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