

Tarea: Algebra de funciones

Algebra de funciones:

Para las funciones siguientes, realiza las operaciones indicadas y determina el dominio de la función resultante:

- 1) $f(x) = 2x^3 - \frac{3}{x}$; $g(x) = x^2 + \frac{3}{x} + 5$ obtenga $(f + g)(x)$; $(f - g)(x)$;
- 2) $f(x) = x^2 - 5x$; $g(x) = \frac{3}{x-5}$ obtenga $(f \cdot g)(x)$; $\left(\frac{g}{f}\right)(x)$;
- 3) $f(x) = \frac{x}{x^2-2x}$; $g(x) = \frac{3}{x-2}$ obtenga $(f + g)(x)$; $(f \cdot g)(x)$; $\left(\frac{f}{g}\right)(x)$
- 4) $f(x) = \sqrt{16 - x^2}$; $g(x) = \sqrt{3 + x}$ obtenga $(f + g)(x)$; $(f \cdot g)(x)$; $\left(\frac{f}{g}\right)(x)$; $\left(\frac{g}{f}\right)(x)$
- 5) $f(x) = \sqrt{16 + x}$; $g(x) = \frac{3}{x^2-25}$ obtenga $(f + g)(x)$; $(f \cdot g)(x)$; $\left(\frac{f}{g}\right)(x)$; $\left(\frac{g}{f}\right)(x)$
- 6) $f(x) = x + 3$; $g(x) = x^2 - 2$ obtenga $(f \circ g)(x)$; $(g \circ f)(x)$
- 7) $f(x) = x^2 - 5x$; $g(x) = \frac{7}{x}$ obtenga $(f \circ g)(x)$; $(g \circ f)(x)$
- 8) $f(x) = \sqrt{9 + x}$; $g(x) = \frac{2}{x}$; obtenga $(g \circ f)(x)$;
- 9) $f(x) = \sqrt{16 + x}$; $g(x) = \frac{3}{x^2-4}$; obtenga $(g \circ f)(x)$;
- 10) $f(x) = \sqrt{10 + x}$; $g(x) = \frac{2}{25-x^2}$; obtenga $(g \circ f)(x)$;

Respuestas

- 1) $(f + g)(x) = 2x^3 + x^2 + 5$; $(f - g)(x) = 2x^3 - x^2 - \frac{6}{x} - 5$; $D_{f+g} = D_{f-g} = D_{f \cdot g} = x \in \mathbb{R} - \{0\}$;
- 2) $(f \cdot g)(x) = 3x$; $\left(\frac{g}{f}\right)(x) = \frac{3}{x(x-5)^2}$; $D_{f \cdot g} = x \in \mathbb{R} - \{5\}$ $D_{\frac{g}{f}} = x \in \mathbb{R} - \{0,5\}$
- 3) $(f + g)(x) = \frac{4x}{x^2-2x}$; $(f \cdot g)(x) = \frac{3x}{x(x-2)^2}$; $\left(\frac{f}{g}\right)(x) = \frac{1}{3}$; $D_{f+g} = D_{f \cdot g} = D_{\frac{f}{g}} = x \in \mathbb{R} - \{0,2\}$;
- 4) $(f + g)(x) = \sqrt{16 - x^2} + \sqrt{3 + x}$; $(f \cdot g)(x) = \sqrt{(16 - x^2)(3 + x)}$; $\left(\frac{f}{g}\right)(x) = \frac{\sqrt{16-x^2}}{\sqrt{3+x}}$; $\left(\frac{g}{f}\right)(x) = \frac{\sqrt{3+x}}{\sqrt{16-x^2}}$
 $D_{f+g} = D_{f \cdot g} = x \in [-3,4]$; $D_{\frac{f}{g}} = x \in (-3,4]$; $D_{\frac{g}{f}} = x \in [-3,4)$
- 5) $(f + g)(x) = \sqrt{16 + x} + \frac{3}{x^2-25}$; $(f \cdot g)(x) = \frac{3\sqrt{16+x}}{x^2-25}$; $\left(\frac{f}{g}\right)(x) = \frac{(x^2-25)\sqrt{16+x}}{3}$; $\left(\frac{g}{f}\right)(x) = \frac{3}{(x^2-25)\sqrt{16+x}}$
 $D_{f+g} = D_{f \cdot g} = D_{\frac{f}{g}} = x \in [-16, \infty) - \{-5,5\}$; $D_{\frac{g}{f}} = x \in (-16, \infty) - \{-5,5\}$
- 6) $(f \circ g)(x) = x^2 + 1$; $D_{f \circ g} = x \in \mathbb{R}$; $(g \circ f)(x) = x^2 + 6x + 7$; $D_{g \circ f} = x \in \mathbb{R}$
- 7) $(f \circ g)(x) = \frac{49}{x^2} - \frac{35}{x}$; $D_{f \circ g} = x \in \mathbb{R} - \{0\}$; $(g \circ f)(x) = \frac{7}{x^2-5x}$; $D_{g \circ f} = x \in \mathbb{R} - \{0,5\}$
- 8) $(g \circ f)(x) = \frac{2}{\sqrt{9+x}}$; $D_{g \circ f} = x \in (-9, \infty)$
- 9) $(g \circ f)(x) = \frac{3}{12+x}$; $D_{g \circ f} = x \in [-16, \infty) - \{-12\}$
- 10) $(g \circ f)(x) = \frac{2}{15-x}$; $D_{g \circ f} = x \in [-10, \infty) - \{15\}$