

$f(x) = x^3 + 4x^2$; $g(x) = 6x^2 - 1$. $D = \mathbb{R}$ for both f and g .

(a) $(f + g)(x) = (x^3 + 4x^2) + (6x^2 - 1) = x^3 + 10x^2 - 1$, $D = \mathbb{R}$.

(b) $(f - g)(x) = (x^3 + 4x^2) - (6x^2 - 1) = x^3 - 2x^2 + 1$, $D = \mathbb{R}$.

(c) $(fg)(x) = (x^3 + 4x^2)(6x^2 - 1)$, $D = \mathbb{R}$.

(d) $\left(\frac{f}{g}\right)(x) = \frac{x^3 + 4x^2}{6x^2 - 1}$, $D = \left\{x \mid x \neq \pm\sqrt{\frac{1}{6}}\right\}$ since $6x^2 - 1 \neq 0$.