Performing Function Operations

Lesson 5.5

Adding Functions

(f + g)(x) = f(x) + g(x)

Find (f + g)(x) if f(x) = $5\sqrt{x}$ and g(x) = $-8\sqrt{x}$.

$$5\sqrt{x} - 8\sqrt{x} = -3\sqrt{x}$$

Subtracting Functions

$\sqrt{-n}$

$\sqrt[4]{-n}$

$\sqrt[6]{-n}$

(f - g)(x) = f(x) - g(x)

Find (f - g)(x) if f(x) = 2x³ + 4x² − 8x + 4 and g(x) = 3x³ − 5x² + 6x - 9.
State the domain. Evaluate the difference when x = -1.

$$2x^3 + 4x^2 - 8x + 4$$

$$-3x^3 + 5x^2 - 6x + 9$$

$$-x^3 + 9x^2 - 14x + 13$$

$-(-1)^3 + 9(-1)^2 - 14(-1) + 13$

Domain: ℝ

$(-\infty, \infty)$

$-1 \mid -1 \quad 9 \quad -14 \quad 13$

Multiplying Functions

$$\not\vee \quad \sqrt{-n}$$

$$\sqrt[4]{-n}$$

(fg)(x) = f(x) • g(x)

Find (fg)(x) if f(x) = x³ and g(x) = $\sqrt{x}$. State the domain. Evaluate the product when x = 4.

$$(fg)(x) = x^3 \sqrt{x}$$

$$(4)^3 \sqrt{4}$$

$$64 (2)$$

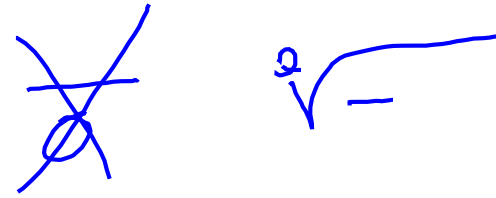$$\boxed{128}$$

$$\mathbb{R} \text{ st } x \gtreqless 0$$

$$(0 , +\infty)$$

Dividing Functions

$$\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)}$$

Find $\left(\frac{f}{g}\right)(x)$ if f(x) = 4x and g(x) = $x^{2/3}$. State the domain. Evaluate

the quotient when x = 27. (Find $\left(\frac{f}{g}\right)(27)$.)

$$\left(\frac{f}{g}\right)x = \frac{4x^1}{x^{2/3}} = 4x^{1/3} = \boxed{4\sqrt[3]{x}}$$

Rst $x \neq 0$

$(-\infty, 0)(0, \infty)$

$4\sqrt[3]{27} = 4 \cdot 3$

$= 12$

$\overline{(\sqrt[3]{x})^2}$

$\sqrt{(\sqrt[3]{x})^2} \neq \sqrt{0}$

$\sqrt[3]{x} \neq 0$