

R53

$$\text{b5. } (x^2 + 1)^2 - 4x^2$$

$$(x^2 + 1 + 2x)(x^2 + 1 - 2x)$$

$$(x^2 + 2x + 1)(x^2 - 2x + 1)$$

$$(x+1)(x+1)(x-1)(x-1)$$

$$(x+1)^2(x-1)^2$$

$$(x^2 + 1)(x^2 + 1) - 4x^2$$

$$x^4 + 2x^2 + 1 - 4x^2$$

$$x^4 - 2x^2 + 1$$

$$(x^2 - 1)(x^2 - 1)$$

$$(x+1)(x-1)(x+1)(x-1)$$

$$\text{b1. } x^4 - 4x^3 + x^2 - 4x$$

$$x(x^3 - 4x^2 + x - 4)$$

$$x(x^2 + 1)(x - 4)$$

R1.7

Domain

Division by Zero

$$\frac{4}{x}$$

$$x \neq 0$$

$$\{ \text{All reals: } x \neq 0 \}$$

$$\frac{2}{x-5}$$

$$x-5 \neq 0$$

$$x \neq 5$$

$$\sqrt{x+1}$$

$$x+1 \geq 0$$

$$x \geq -1$$

$$\frac{3}{x^2-25}$$

$$\frac{3}{(x+5)(x-5)}$$

$$x+5 \neq 0$$

$$x \neq -5$$

$$x-5 \neq 0$$

$$x \neq 5$$

$$\frac{2}{3} = \frac{8}{12}$$

$$\frac{2}{3} = \frac{4(2)}{4(3)}$$

$$\frac{2y-4}{y+1} = \frac{(3y-4)(y-1)}{y^2-1}$$

$\xrightarrow{\hspace{1cm}}$

$$(y+1)(y-1)$$

$$\frac{9}{15} \quad \text{Reduce}$$

$$\frac{\cancel{3}(3)}{\cancel{3}(5)}$$

$$\frac{3}{5}$$

$$\frac{4x^2}{20x}$$

$$\frac{x}{5}$$

$$\frac{9x^2 + 9x}{2x + 2}$$

Factor

$$\frac{9x(\cancel{x+1})}{2(\cancel{x+1})}$$

$$\frac{9x}{2}$$

$$\frac{2}{3} \cdot \frac{6^2}{7}$$

$$\frac{12}{21}$$

$$\frac{4}{7}$$

$$\frac{4y-16}{5y+15} \cdot \frac{2y+6}{4-y}$$


$$\frac{4(y-4)}{5(y+3)} \cdot \frac{2(y+3)}{4-y}$$

$$\frac{4(y-4)}{5} \cdot \frac{2}{-1(-4+y)}$$

$$\frac{4(y-4)}{5} \cdot \frac{2}{-1(y-4)}$$

$$\frac{8}{-5}$$

$$-\frac{8}{5} \quad \text{or} \quad -\frac{8}{5}$$

$$\frac{x+2}{5x-15} \div \frac{x-2}{5x-15}$$


$$\frac{x+2}{\cancel{5x-15}} \cdot \frac{\cancel{5x-15}}{x-2}$$

$$\frac{x+2}{x-2}$$

$$\frac{2x-1}{x+3} + \frac{1-x}{x+3}$$

$$\frac{x}{x+3}$$

$$\frac{x}{x^2 + x - 2} - \frac{1}{x+2}$$

$$\frac{x}{(x+2)(x-1)} - \frac{1(x-1)}{(x+2)(x-1)}$$

$$\frac{x}{(x+2)(x-1)} - \frac{x-1}{(x+2)(x-1)}$$

$$\frac{1}{(x+2)(x-1)}$$