

Precalculus Algebra Review Worksheet #3 Rational Expressions Selected Solutions

Express each of the following rational expressions in simplest form.

$$4. \frac{5x^3 - 45x}{5x^2 + 12x - 9} = \frac{5x(x-3)}{5x-3}$$

$$\frac{5x(x^2-9)}{(5x-3)(x+3)} = \frac{5x(x+3)(x-3)}{(5x-3)(x+3)} =$$

$$5. \frac{x^3 - x}{x^3 - 1} = \frac{x(x+1)}{x^2 + x + 1}$$

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

$$10. \frac{\frac{x}{5} - \frac{5}{x}}{\frac{x+5}{x}} = \frac{x-5}{5}$$

$$11. \frac{1 + \frac{3}{x}}{x+3} = \frac{1}{x}$$

$$5x\left(\frac{\frac{x}{5} - \frac{5}{x}}{\frac{x+5}{x}}\right) = \frac{x^2-25}{5(x+5)} = \frac{(x+5)(x-5)}{5(x+5)}$$

$$\frac{x\left(1 + \frac{3}{x}\right)}{x(x+3)} = \frac{x+3}{x(x+3)}$$

$$14. \frac{6x^2 - 30x}{6x^2 + 19x + 15} \cdot \frac{2x^2 + 13x + 15}{2x^2 - 10x} = \frac{3(x+5)}{3x+5}$$

$$15. \frac{x^2 + 5x + 6}{x^3 + 8} \cdot \frac{3x^2 - 6x + 12}{4x + 12} = \frac{3}{4}$$

$$\frac{6x(x-5)}{(3x+5)(2x+3)} \cdot \frac{(2x+3)(x+5)}{2x(x-5)} =$$

$$\frac{(x+2)(x+3)}{(x+2)(x^2-2x+4)} \cdot \frac{3(x^2-2x+4)}{4(x+3)}$$

$$19. \frac{6x-9}{10x^2} \div \frac{2x^2-3x}{25} = \frac{15}{2x^3}$$

$$22. \frac{6x^2-7x-5}{4x^2+4x+1} \div \frac{3x^2-12x-15}{4x^2-1} = \frac{(3x-5)(2x-1)}{3(x-5)(x+1)}$$

$$\frac{3(2x-3)}{10x^2} \cdot \frac{25}{x(2x-3)} =$$

$$\frac{(2x+1)(3x-5)}{(2x+1)(2x+1)} \cdot \frac{(2x+1)(2x-1)}{3(x^2-4x-5)} = \frac{2x-1}{3(x-5)(x+1)}$$