

Simplifying Algebraic Fractions by Factoring

Answers

$$1. \frac{5(x^2-6)}{4(x^2-6)} = \frac{5}{4}$$

$$2. (2y)/(3x^2)$$

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

$$4. \frac{x-15}{x-5} \text{ is already reduced and cannot be simplified further.}$$

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

6. Multiply the numerator and denominator by x to get:

$$\frac{\frac{16}{x} - 2x^2}{24x^4 - 2x^3} \times \frac{x}{x} = \frac{\left(\frac{16}{x}\right)x - (2x^2)x}{(24x^4)x - (2x^3)x} = \frac{16 - 2x^3}{24x^5 - 2x^4}$$

The numerator and denominator have a common

factor of 2, so this can be reduced to $\frac{2(8-x^3)}{2(12x^5-x^4)} = \frac{8-x^3}{12x^5-x^4}$.

$$7. \frac{x^2-3x-10}{x^2+4x-45} = \frac{(x-5)(x+2)}{(x-5)(x+9)} = \frac{x+2}{x+9}$$

$$8. \frac{6x^2-x}{x} = \frac{6x^2}{x} - \frac{x}{x} = 6x-1$$

9. Multiply the numerator and the denominator by $1-x$ to get:

$$\frac{\frac{5}{1-x} + 2x}{10x + \frac{4x^2}{1-x}} \times \frac{1-x}{1-x} = \frac{\left(\frac{5}{1-x}\right)(1-x) + (2x)(1-x)}{(10x)(1-x) + \left(\frac{4x^2}{1-x}\right)(1-x)} = \frac{5+2x-2x^2}{10x-10x^2+4x^2}$$

. Now combine like terms.

$$\frac{5+2x-2x^2}{10x-10x^2+4x^2} = \frac{5+2x-2x^2}{10x-6x^2}$$

10. $\frac{6-2x^2}{6-2x} = \frac{2(3-x^2)}{2(3-x)} = \frac{3-x^2}{3-x}$ and this is simplified as much as possible.