

Simplifying Rational Expressions

Factor completely, cancel common factors, and keep all original restrictions.

Name: _____

Date: _____

Simplify each expression completely. State all excluded values.

Factor first. Cancel factors only — never terms across addition or subtraction.

Part A — GCF & Common Factors

1.
$$\frac{6x^2}{9x}$$

Excluded values: _____

2.
$$\frac{x^2 + 5x}{x}$$

Excluded values: _____

3.
$$\frac{2x^2 + 8x}{2x}$$

Excluded values: _____

4.
$$\frac{3x^2 - 12x}{6x}$$

Excluded values: _____

Part B — Difference of Squares & Repeated Factors

5.
$$\frac{x^2 - 9}{x + 3}$$

Excluded values: _____

6.
$$\frac{x^2 - 16}{x^2 - 8x + 16}$$

Excluded values: _____

7.
$$\frac{3x^2 - 12}{x^2 + x - 6}$$

Excluded values: _____

8.
$$\frac{x^3 - 9x}{x^2 - 6x + 9}$$

Excluded values: _____

9.
$$\frac{2x^2 - 18}{x^2 + 6x + 9}$$

Excluded values: _____

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Worksheet — continued

Simplify each expression completely. State all excluded values.

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Part C — Trinomial & Non-Monic Factoring

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

Excluded values: _____

11.
$$\frac{x^2 - 5x + 6}{x^2 - 9}$$

Excluded values: _____

12.
$$\frac{x^2 + 7x + 12}{x^2 + 5x + 4}$$

Excluded values: _____

13.
$$\frac{2x^2 + x - 3}{2x^2 - 5x + 3}$$

Excluded values: _____

14.
$$\frac{4x^2 - 25}{2x^2 + 7x + 5}$$

Excluded values: _____

Part D — Grouping & Sign Reversal

15.
$$\frac{x^3 - 4x}{x^2 - x - 6}$$

Excluded values: _____

16.
$$\frac{x^2 - 4}{2 - x}$$

Excluded values: _____

17.
$$\frac{x^3 + 2x^2 - 9x - 18}{x^2 + 5x + 6}$$

Excluded values: _____

18.
$$\frac{x^3 - 4x^2 - x + 4}{x^2 - 1}$$

Excluded values: _____