SIMPLIFYING RATIONAL EXPRESSIONS

Perform the indicated operations and simplify to lowest terms.

1. $\dfrac{12x^2 - 8x - 15}{2x^2 + 5x - 12}$

2. $\dfrac{2x+3}{x-4} \cdot \dfrac{x^2-16}{6x+9}$

3. $\dfrac{x^2 - 6x + 8}{x^2 + 3x - 18} \div \dfrac{x-4}{x+6}$

4. $\dfrac{x^2-4}{x+3} \cdot \dfrac{x^2 - 2x - 15}{x^2 - 3x - 10}$

5. $\dfrac{16x^2 - 9}{12x^2 + 6x} \div \dfrac{12x^2 - 13x + 3}{12x^2 + 2x - 2}$

6. $\dfrac{64x^2 - 9}{3x^2 + 15x} \div \dfrac{16x^2 - 2x - 3}{2x^2 + 9x - 5}$

7. $\dfrac{x^2 - 9}{x^2 + 7x + 12} \div \dfrac{x - 3}{x + 5}$

8. $\dfrac{x-7}{x-2} - \dfrac{x-2}{2-x}$

9. $\dfrac{3}{x^2 - 4x} - \dfrac{4}{x^2 + 2x}$

10. $\dfrac{3x-1}{x^2 + 5x + 4} - \dfrac{x-9}{x^2 + 5x + 4}$

11. $\dfrac{4}{x-5} + \dfrac{3}{x+2}$

12. $\dfrac{1}{x^2 - 16} - \dfrac{7}{x^2 - 2x - 8}$

13. $\dfrac{1}{x^2 - 25} - \dfrac{x+2}{x^2 + 4x - 5}$

14. $\dfrac{1}{x^2 - 36} - \dfrac{x-3}{x^2 - 4x - 12}$

15. $\dfrac{\dfrac{1}{y} + 9}{\dfrac{1}{y^2} - 81}$

16. $\dfrac{1 - \dfrac{3}{2x}}{x - \dfrac{9}{4x}}$

17. $\dfrac{4 - \dfrac{1}{y^2}}{2 - \dfrac{1}{y}}$

18. $\dfrac{9 - \dfrac{1}{y^2}}{3 + \dfrac{1}{y}}$

19. Find the values where the expression is undefined. $\dfrac{x^2 + 6x + 5}{x^2 + 7x - 18}$

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Answers

1. $\frac{6x+5}{x+4}$
2. $\frac{x+4}{3}$
3. $\frac{x-2}{x-3}$
4. $x-2$
5. $\frac{4x+3}{3x}$
6. $\frac{8x-3}{3x}$
7. $\frac{x+5}{x+4}$
8. $\frac{2x-9}{x-2}$
9. $\frac{-x+22}{x(x-4)(x+2)}$
10. $\frac{2}{x+1}$
11. $\frac{7(x-1)}{(x+2)(x-5)}$
12. $\frac{-2(3x+13)}{(x-4)(x+2)(x+4)}$
13. $\frac{-x^2+4x+9}{(x-5)(x+5)(x-1)}$
14. $\frac{-x^2-2x+20}{(x+6)(x-6)(x+2)}$
15. $\frac{y}{1-9y}$
16. $\frac{2}{2x+3}$
17. $\frac{2y+1}{y}$
18. $\frac{3y-1}{y}$
19. $\{x \mid x \neq -9 \quad or \quad x \neq 2\}$