

**Simplify each rational expression. State any restrictions on the variables.**

1.  $\frac{4x + 6}{2x + 3}$

2.  $\frac{2y}{y^2 + 6y}$

3.  $\frac{20 + 40x}{20x}$

4.  $\frac{7x - 28}{x^2 - 16}$

5.  $\frac{3y^2 - 3}{y^2 - 1}$

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

7.  $\frac{x^2 + 3x - 18}{x^2 - 36}$

8.  $\frac{x^2 + 13x + 40}{x^2 - 2x - 35}$

**Multiply. State any restrictions on the variables.**

9.  $\frac{5a}{5a + 5} \cdot \frac{10a + 10}{a}$

10.  $\frac{2x + 4}{10x} \cdot \frac{15x^2}{x + 2}$

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

12.  $\frac{x^2 - 6x}{x^2 - 36} \cdot \frac{x + 6}{x^2}$

13.  $\frac{5y - 20}{3y + 15} \cdot \frac{7y + 35}{10y + 40}$

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

15.  $\frac{3x^3}{x^2 - 25} \cdot \frac{x^2 + 6x + 5}{x^2}$

16.  $\frac{y^2 - 2y}{y^2 + 7y - 18} \cdot \frac{y^2 - 81}{y^2 - 11y + 18}$

**Divide. State any restrictions on the variables.**

17.  $\frac{7x^4}{24y^5} \div \frac{21x}{12y^4}$

18.  $\frac{6x + 6}{7} \div \frac{4x + 4}{x - 2}$

19.  $\frac{5y}{2x^2} \div \frac{5y^2}{8x^2}$

20.  $\frac{3y + 3}{6y + 12} \div \frac{18}{5y + 5}$

21.  $\frac{y^2 - 49}{(y - 7)^2} \div \frac{5y + 35}{y^2 - 7y}$

22.  $\frac{x^2 + 10x + 16}{x^2 - 6x - 16} \div \frac{x + 8}{x^2 - 64}$

23.  $\frac{y^2 - 5y + 4}{y^2 - 1} \div \frac{y^2 - 9}{y^2 + 5y + 4}$

24.  $\frac{x^2 - 4}{x^2 + 6x + 9} \div \frac{x^2 + 4x + 4}{x^2 - 9}$

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