

2.2 Multiplication and Division of Rational Expressions

Name _____

Multiply and simplify.

1.

$$\frac{16x^2}{y^4} \cdot \frac{5x^2}{4y^2}$$

2.

$$\frac{12x^3y}{6xy^5} \cdot \frac{5xy^2}{25x^4y^4}$$

3.

$$\frac{3a^2}{a+2} \cdot \frac{a^2-4}{3a}$$

4.

$$\frac{y-1}{4y} \cdot \frac{8y^2-16y}{3-3y}$$

5.

$$\frac{x-4}{3-x} \cdot \frac{x-3}{3x-12}$$

6.

$$\frac{x^2-4}{3x+12} \cdot \frac{x+4}{2-x}$$

Answers: 1. $\frac{20x^4}{y^6}$; 3. $a(a-2)$; 5. $-\frac{1}{3}$

Multiply and simplify.

7.

$$\frac{x^2 + 5x + 6}{x^2 - 5x - 14} \cdot \frac{x^2 - 3x - 28}{x^2 + 4x + 3}$$

8.

$$\frac{x^2 + 3x - 10}{x^2 - 7x + 6} \cdot \frac{x^2 - 3x - 18}{x^2 + 8x + 15}$$

9.

$$\frac{2y^2 - 5y - 12}{4y^2 + 8y + 3} \cdot \frac{2y^2 + 7y + 3}{y^2 - 16}$$

10.

$$\frac{x^2 - 7x + 12}{x^2 + 2x - 15} \cdot \frac{x^2 - 25}{x^2 - 16}$$

Answers: 7. $\frac{x+4}{x+1}$; 9. $\frac{y+3}{y+4}$

Divide and simplify.

11.

$$\frac{9x^3}{4} \div \frac{3}{16y^2}$$

12.

$$\frac{12x^8}{3y^4} \div \frac{16x^3}{6y}$$

13.

$$\frac{y^2 + 2y}{6y} \div \frac{y^2 - 4}{3y^2}$$

14.

$$\frac{3y + 15}{y} \div \frac{y + 5}{y}$$

15.

$$\frac{y^2 - 36}{y^2 - 8y + 16} \div \frac{3y - 18}{y^2 - y - 12}$$

16.

$$\frac{y^2 + y - 12}{y^3 + 9y^2 + 20y} \div \frac{y^2 - 9}{y^3 + 3y^2}$$

Answers: 11. $12x^3y^2$; 12. $\frac{y^2}{2(y-2)}$; 13. $\frac{(y+6)(y+3)}{3(y-4)}$

Simplify completely.

17.

$$\frac{2x^2 - 3x - 14}{2x^2 - 9x + 7} \div \frac{6x^2 + x - 15}{3x^2 + 2x - 5} \cdot \frac{6x^2 - 7x - 3}{2x^2 - x - 3}$$

18.

$$\frac{10x^2 - 17x + 3}{15x^2 - 8x + 1} \div \frac{4x^2 - 12x + 9}{3x^2 + 3xy - x - y} \cdot \frac{6x^2 - 11x + 3}{2x^2 - 11x + 12}$$

19.

$$\frac{x^3 - 27}{x^2 - 9} \cdot \frac{x^2 - 6x + 9}{x^2 + 3x + 9}$$

20.

$$\frac{x^3 - 64}{x^3 + 64} \div \frac{x^2 - 16}{x^2 - 4x + 16}$$

Answers: 17. $\frac{(x+2)(3x+1)}{(2x-3)(x+1)}$; 19. $\frac{(x-3)^2}{x+3}$