

Name:

Date:

Topic:

Class:

Main Ideas/Questions Notes/Examples

MULTIPLYING
Rational Expressions

If the problem contains-

- **Monomials only:** Multiply together, then simplify.
- **Binomials/Trinomials:** Factor everything you can FIRST, then simplify.

Example 1: $\frac{10a^3bd}{5ab^2} \cdot \frac{a^2bc^2}{4cd}$

Example 2: $\frac{x^2 - 16}{2x + 8} \cdot \frac{x + 4}{x^2 + 8x + 16}$

YOU TRY!

Find each product. Final answers must be written in simplest form.

1. $\frac{3k^2}{2k} \cdot \frac{k^2}{12}$

2. $\frac{3x^2}{2y} \cdot \frac{4y^2}{9}$

3. $\frac{14}{c^2} \cdot \frac{c^5}{2c}$

4. $\frac{2x^2y}{3x^2y} \cdot \frac{3xy}{4y}$

5. $\frac{c^2 - 1}{2c - 14} \cdot \frac{c^2 - 4c - 21}{c^2 + 2c - 3}$

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

7. $\frac{2w - 12}{7w} \cdot \frac{14}{3w - 18}$

8. $\frac{m + 2}{m^2 - 3m} \cdot \frac{8m^2}{m + 2}$

| | | |
|--|--|--|
| | 9. $\frac{4p+8}{p^2-2p} \cdot \frac{p-2}{p+2}$ | 10. $\frac{a+5}{3a+6} \cdot \frac{3a^2+6a}{a^2+2a-15}$ |
| | 11. $\frac{x^2-49}{x^2+5x} \cdot \frac{x+5}{x+7}$ | 12. $\frac{v^2-4}{5v+10} \cdot \frac{v+2}{v-2}$ |
| | 13. $\frac{y^2-36}{y^2-25} \cdot \frac{y+5}{y-6}$ | 14. $\frac{r^2+2r+1}{r-1} \cdot \frac{3r-3}{r+1}$ |
| | 15. $\frac{n^2+10n+16}{5n-10} \cdot \frac{n-2}{n^2+9n+8}$ | 16. $\frac{b^2-2b-24}{b^2-36} \cdot \frac{b^2+5b-6}{b^2+2b-8}$ |
| | 17. $\frac{2n^2-10n}{n^2-9n+20} \cdot \frac{n^2-8n+16}{4n^2}$ | 18. $\frac{x^2+7x+12}{x^2+8x+16} \cdot \frac{x+4}{x+3}$ |
| | 19. $\frac{2k+4}{k+4} \cdot \frac{5k^2+21k+4}{10k+2}$ | 20. $\frac{3y^2-7y+4}{12y^2-4y} \cdot \frac{3y-1}{15y^3-20y^2}$ |

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DIVIDING
Rational Expressions

To divide rational expressions, multiply by the _____!

Example 1: $\frac{12c^2d}{5a^2b^2} \div \frac{c^2d^2}{10ab}$

Example 2: $\frac{x^2 + 6x - 27}{x^2 + 11x + 18} \div \frac{x - 3}{x^2 + x - 2}$

YOU TRY!

Find each quotient. Final answers must be written in simplest form.

1. $\frac{x^3}{y^2} \div \frac{x^3}{y}$

2. $\frac{4a^3}{bc^2} \div \frac{2a}{bc}$

3. $\frac{6a^3}{4b^2} \div \frac{2a^2}{12b^2}$

4. $\frac{6x^2y}{3y} \div 2xy$

5. $\frac{15x^2y^2}{3} \div 3xy$

6. $\left(\frac{2x^2}{3} \cdot \frac{6}{x}\right) \div \frac{8x^2}{25}$

7. $\frac{8z - 16}{20} \div \frac{3z - 6}{40}$

8. $\frac{y^2 - 8y + 7}{10y^2} \div \frac{y - 7}{5y}$

$$9. \frac{b^2 - 81}{b} \div (b + 9)$$

$$10. \frac{6x^2 + x - 1}{2x + 1} \div (9x - 3)$$

$$11. \frac{9d^4}{d - 3} \div \frac{d}{d - 3}$$

$$12. \frac{6x^2 + 36x}{4x} \div \frac{4x + 24}{2x^2}$$

$$13. \frac{y^2 + 5y - 14}{9y} \div \frac{y^2 - 8y + 12}{3y}$$

$$14. \frac{x^2 - 2x - 15}{x - 2} \div \frac{x^2 - 10x + 25}{x - 2}$$

$$15. \frac{6x + 6}{x - 1} \div \frac{x^2 + 3x + 2}{2x - 2}$$

$$16. \frac{b + 4}{b^2 - 6b - 16} \div \frac{2b + 8}{b - 8}$$

$$17. \frac{9x^2 + 6x + 1}{x + 5} \div \frac{3x + 1}{x^2 + 5x}$$

$$18. \frac{9x^3}{x^3 - x} \div \frac{x - 8}{x^2 - 9x + 8}$$