

LESSON 8.2 Skills Practice



Name _____ Date _____

Different Client, Same Deal
Multiplying and Dividing Rational Expressions

Problem Set

Perform the indicated operation. Simplify the answer when possible.

1. $\frac{2}{21} \cdot \frac{3}{4}$ _____ 2. $\frac{15}{22} \cdot \frac{8}{15}$ _____

$$\frac{2}{21} \cdot \frac{3}{4} = \frac{\cancel{2}}{\cancel{21}^7} \cdot \frac{\cancel{3}^1}{\cancel{4}^2} = \frac{1}{14}$$

3. $\frac{27}{32} \cdot \frac{1}{8} \cdot \frac{16}{9}$ _____ 4. $\frac{8}{9} \div \frac{2}{3}$ _____

5. $\frac{4}{21} \div \frac{12}{49}$ _____ 6. $\frac{1}{8} \div \frac{7}{4} \div \frac{1}{14}$ _____

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Multiply each expression. Describe any restriction(s) for the variables and simplify the answer when possible.

7. $\frac{5x^2}{7} \cdot \frac{14}{3x}$

$$\begin{aligned}\frac{5x^2}{7} \cdot \frac{14}{3x} &= \frac{5\cancel{x^2}^x}{7} \cdot \frac{14}{3\cancel{x}_1} \\ &= \frac{10x}{3}; x \neq 0\end{aligned}$$

8. $\frac{2ab^2}{5c^3} \cdot \frac{15c}{4a}$

9. $\frac{3mn^2}{10} \cdot \frac{m^2}{8n} \cdot \frac{20}{3n^2}$

10. $\frac{x+1}{x} \cdot \frac{x^2}{2x+2}$

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11. $\frac{x^2 - 4}{x + 5} \cdot \frac{x + 5}{x - 2}$

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

13. $\frac{x^2 - 4x}{x - 2} \cdot \frac{2 - x}{x}$

14. $\frac{1}{2x^2 + 3x - 2} \cdot \frac{x^2 - 2x - 8}{x - 4}$

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$$15. \frac{x+3}{x-5} \cdot \frac{1}{x^2+6x+9} \cdot (x^2-25)$$

$$16. \frac{5x^2}{x+4} \cdot \frac{3x^2+12x}{7x-7} \cdot \frac{x^2-2x+1}{3}$$

Determine the quotient of each expression. Describe any restriction(s) for the variables and simplify the answer when possible.

$$17. \frac{3c^2}{5ab} \div \frac{9}{2a}$$

Restrictions: $a \neq 0, b \neq 0$

$$\begin{aligned} \frac{3c^2}{5ab} \div \frac{9}{2a} &= \frac{3c^2}{5ab} \cdot \frac{2a}{9} \\ &= \frac{\overset{1}{3}c^2}{\underset{1}{5}a\overset{1}{b}} \cdot \frac{\overset{1}{2}a}{\underset{3}{9}} \\ &= \frac{2c^2}{15b} \end{aligned}$$

$$18. \frac{4x^2y}{5z^4} \div \frac{2x}{z} \div \frac{1}{2z}$$

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19. $\frac{x^2 + 1}{x} \div \frac{x^2 - 1}{2x}$

20. $\frac{x^2 + 6x - 27}{x^2} \div \frac{x^2 - 3x}{9}$

21. $\frac{x^2 + 6x + 8}{3x + 2} \div \frac{-x - 4}{3x^2 - x - 2}$

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

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

24. $\frac{x^2 + 4x + 3}{2x^2 - 11x + 5} \div \frac{x^2 + 3x}{2x - 1}$

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25.
$$\frac{x^2 - 121}{x^2 + x - 20} \div \frac{x^2 - 10x + 1}{x^2 - 25}$$

26.
$$\frac{(x - 5)^3}{(x + 2)^2(2x - 3)^4} \div \frac{(x - 5)^5}{(x + 2)(2x - 3)^2}$$