

Questions: Arithmetic on algebraic fractions

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Summary

A selection of questions for the study guide on arithmetic on algebraic fractions.

Before attempting these questions, it is highly recommended that you read [Guide: Arithmetic on algebraic fractions](#).

Q1

Calculate the following additions and subtractions by first finding a common denominator. Write your answer in its simplest form. Assume that all denominators are non-zero.

1.1. $\frac{2}{x} + \frac{5}{x}$

1.2. $\frac{x+1}{3} + \frac{x-2}{3}$

1.3. $\frac{4}{y} - \frac{1}{y}$

1.4. $\frac{3}{4x} + \frac{1}{4x}$

1.5. $\frac{x-3}{5} - \frac{x+2}{5}$

1.6. $\frac{1}{x} + \frac{1}{2x}$

1.7. $\frac{3}{5y} - \frac{2}{15y}$

1.8. $\frac{x}{3} + \frac{x}{6}$

1.9. $\frac{2}{x} + \frac{3}{x+1}$

1.10. $\frac{x+4}{x-1} - \frac{x-2}{x-1}$

1.11. $\frac{5}{x-3} + \frac{2}{2x-6}$

1.12. $\frac{2}{x+2} - \frac{1}{x-2}$

$$1.13. \quad \frac{x+1}{x^2} + \frac{2}{x}$$

$$1.14. \quad \frac{3x}{x^2-9} + \frac{2x}{x+3}$$

$$1.15. \quad \frac{x-1}{x+2} - \frac{2x+3}{x^2+4x+4}$$

Q2

Calculate the following multiplications. Write your answer in its simplest form. Assume that all denominators are non-zero.

$$2.1. \quad \frac{x}{3} \cdot \frac{2}{5}$$

$$2.2. \quad \frac{3a}{4} \cdot \frac{8}{a}$$

$$2.3. \quad \frac{x+1}{2} \cdot \frac{x}{3}$$

$$2.4. \quad \frac{5y}{2x} \cdot \frac{3x}{10y}$$

$$2.5. \quad \frac{x-3}{x} \cdot \frac{x}{4}$$

$$2.6. \quad -\frac{2x}{5} \cdot \frac{15}{x^2}$$

$$2.7. \quad \frac{x^2-9}{x+3} \cdot \frac{x}{2x-6}$$

$$2.8. \quad \frac{x+2}{x-1} \cdot \frac{x-1}{x+3}$$

$$2.9. \quad \frac{3x}{x^2+2x} \cdot \frac{x+2}{4}$$

$$2.10. \quad \frac{x^2+5x+6}{x+1} \cdot \frac{1}{x+2}$$

$$2.11. \quad -\frac{x-4}{2x} \cdot \frac{3x}{x-4}$$

$$2.12. \quad \frac{2x}{x^2-4} \cdot \frac{x+2}{3}$$

Q3

Calculate the following divisions. Write your answer in its simplest form. Assume that all denominators are non-zero.

$$3.1. \quad \frac{x}{2} \div \frac{x}{5}$$

$$3.2. \quad \frac{3}{x} \div \frac{1}{2x}$$

$$3.3. \quad \frac{x+1}{4} \div \frac{x+1}{2}$$

$$3.4. \quad \frac{2x}{3y} \div \frac{4}{9y}$$

$$3.5. \quad \frac{x-2}{x} \div \frac{3}{4}$$

$$3.6. \quad \frac{x^2-1}{x+1} \div x$$

$$3.7. \quad -\frac{3x}{5} \div \frac{x}{10}$$

$$3.8. \quad \frac{x^2+3x}{x} \div \frac{x+3}{2}$$

$$3.9. \quad \frac{x}{x-4} \div \frac{2x}{x-4}$$

$$3.10. \quad \frac{x^2-9}{x^2-3x} \div \frac{x-3}{x}$$

$$3.11. \quad \frac{2x}{x+2} \div \frac{x}{x+2}$$

$$3.12. \quad \frac{x^2-4}{2x} \div \frac{x-2}{3}$$

Q4

Simplify the following compound algebraic fractions. Write your answer in its simplest form.

Assume that all denominators are non-zero.

$$4.1. \quad \frac{\frac{1}{x} + \frac{1}{y}}{\frac{1}{x}}$$

$$4.2. \quad \frac{-\frac{2x}{3}}{\frac{x+2}{9}}$$

$$4.3. \quad \frac{\frac{x}{x-1}}{\frac{x-1}{2x}}$$

$$4.4. \quad \frac{\frac{1}{x} + \frac{2}{x^2}}{\frac{3}{x}}$$

4.5.
$$\frac{\frac{x+1}{2x}}{\frac{x-1}{4x^2}}$$

After attempting the questions above, please click [this link](#) to find the answers.

Version history and licensing

v1.0: initial version created 12/25 by Donald Campbell as part of a University of St Andrews VIP project.

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