

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. You should give your answer in its simplest form. You may assume that all denominators are non-zero, so you do not need to write restrictions.

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. $\frac{b-3}{5} - \frac{b+2}{5}$

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. $\frac{t+4}{t-1} - \frac{t-2}{t-1}$

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

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

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

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

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

Q2

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

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

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

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

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

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

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

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

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

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

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

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

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

Q3

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

- 3.1. $\frac{t}{2} \div \frac{t}{5}$
- 3.2. $\frac{3}{x} \div \frac{1}{2x}$
- 3.3. $\frac{x+1}{4} \div \frac{x+1}{2}$
- 3.4. $\frac{2x}{3y} \div \frac{4}{9y}$
- 3.5. $\frac{x-2}{x} \div \frac{3}{4}$
- 3.6. $\frac{v^2-1}{v+1} \div v$
- 3.7. $-\frac{3x}{5} \div \frac{x}{10}$
- 3.8. $\frac{x^2+3x}{x} \div \frac{x+3}{2}$
- 3.9. $\frac{x}{x-4} \div \frac{2x}{x-4}$
- 3.10. $\frac{x^2-9}{x^2-3x} \div \frac{x-3}{x}$
- 3.11. $\frac{2n}{n+2} \div \frac{n}{n+2}$
- 3.12. $\frac{x^2-4}{2x} \div \frac{x-2}{3}$

Q4

Simplify the following compound algebraic fractions. Write your answer in its simplest form. Assume that all denominators are non-zero.

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

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

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

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

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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