Learning Objective: To multiply, divide, add, and subtract algebraic fractions.
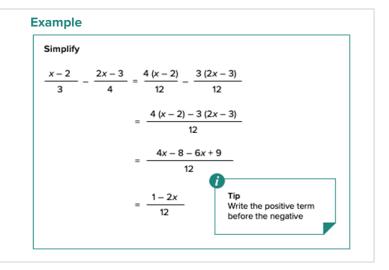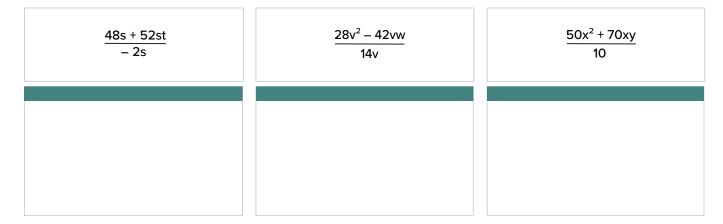
Equations with Algebraic Fractions

To add or subtract algebraic fractions:

- Find the lowest common denominator (LCD)

- Form equivalent fractions using the LCD

- Add or subtract the numerators

- Simplify the fraction by factorising and cancelling

Example

Simplify

$$\frac{x-2}{3} - \frac{2x-3}{4} = \frac{4(x-2)}{12} - \frac{3(2x-3)}{12}$$

$$= \frac{4(x-2) - 3(2x-3)}{12}$$

$$= \frac{4x - 8 - 6x + 9}{12}$$

$$= \frac{1 - 2x}{12}$$

Tip
Write the positive term before the negative

Simplify the fractions.

$$\frac{48s + 52st}{-2s}$$

$$\frac{28v^2 - 42vw}{14v}$$

$$\frac{50x^2 + 70xy}{10}$$

Simplify the following.

$$\frac{2x-5}{7} - \frac{x-4}{2}$$

$$\frac{3-4k}{9} + \frac{k-1}{6}$$

$$\frac{1-a}{9} - \frac{4a-2}{12}$$

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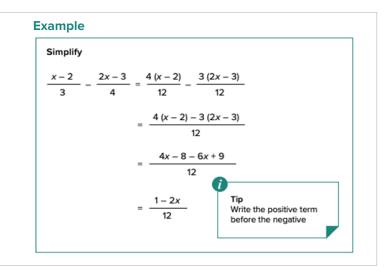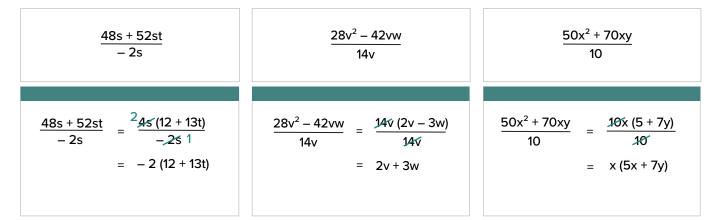
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ⓘ **Tip**
Write the positive term before the negative

Simplify the fractions.

$$\frac{48s + 52st}{-2s}$$

$$\frac{28v^2 - 42vw}{14v}$$

$$\frac{50x^2 + 70xy}{10}$$

$$\frac{48s + 52st}{-2s} = \frac{\overset{2}{4s}(12 + 13t)}{\underset{1}{-2s}}$$

$$= -2(12 + 13t)$$

$$\frac{28v^2 - 42vw}{14v} = \frac{14v(2v - 3w)}{14v}$$

$$= 2v + 3w$$

$$\frac{50x^2 + 70xy}{10} = \frac{10x(5 + 7y)}{10}$$

$$= x(5x + 7y)$$

Simplify the following.

$$\frac{2x - 5}{7} - \frac{x - 4}{2}$$

$$\frac{3 - 4k}{9} + \frac{k - 1}{6}$$

$$\frac{1 - a}{9} - \frac{4a - 2}{12}$$

$$\frac{2x-5}{7} - \frac{x-4}{2} = \frac{2(2x-5)}{14} - \frac{7(x-4)}{14}$$

$$= \frac{4x - 10 - 7(x-4)}{14}$$

$$= \frac{4x - 10 - 7x + 28}{14}$$

$$= \frac{18 - 3x}{14}$$

$$\frac{3-4k}{9} + \frac{k-1}{6} = \frac{4(3-4k)}{36} + \frac{6(k-1)}{36}$$

$$= \frac{12 + 16k + 6k - 6}{36}$$

$$= \frac{6 - 10k}{36}$$

$$= \frac{\overset{}{2}(3 - 5k)}{\underset{18}{36}}$$

$$= \frac{3 - 5k}{18}$$

$$\frac{1-a}{9} - \frac{4a-2}{12} = \frac{4(1-a)}{36} - \frac{3(4a-2)}{36}$$

$$= \frac{4 - 4a + 12a - 6}{36}$$

$$= \frac{8a - 2}{36}$$

$$= \frac{\overset{}{2}(4a - 1)}{\underset{18}{36}}$$

$$= \frac{4a - 1}{18}$$