



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 $\frac{x-2}{3} - \frac{2x-3}{4} = \frac{4(x-2)}{12} - \frac{3(2x-3)}{12}$ Write the positive before the negative Write the positive term

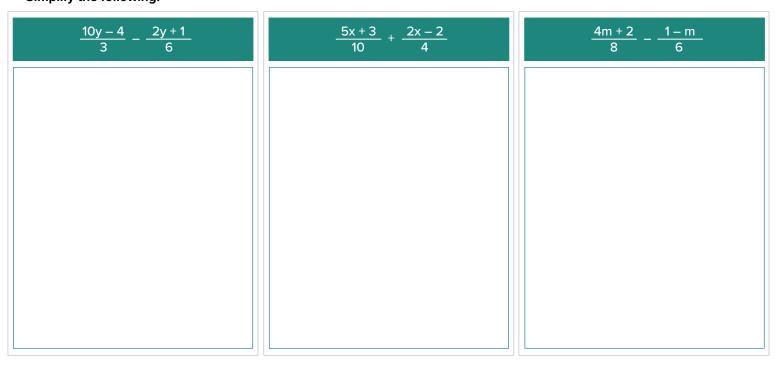
#### Simplify the fractions.

$$\frac{36a^2 + 27a}{3a}$$

$$\frac{24pq - 32p^2}{4p}$$

$$\frac{30b^2 + 72b}{-3b}$$

#### Simplify the following.





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# Example Simplify $\frac{x-2}{3} - \frac{2x-3}{4} = \frac{4(x-2)}{12} - \frac{3(2x-3)}{12}$ $= \frac{4x - 8 - 6x + 9}{12}$ $= \frac{1 - 2x}{12}$ Tip Write the positive term before the negative

#### Simplify the fractions.

$$\frac{36a^2 + 27a}{3a}$$

$$\frac{24pq - 32p^2}{4p}$$

$$\frac{30b^2 + 72b}{-3b}$$

$$\frac{36a^{2} + 27a}{3a} = \frac{9a (4a + 3)}{3a}$$

$$= \frac{39a (4a + 3)}{3a}$$

$$= 3 (4a + 3)$$

$$\frac{24pq - 32p^2}{4p} = \frac{28p(3q - 4p)}{4p}$$
$$= 2(3q - 4p)$$

$$\frac{30b^2 + 72b}{-3b} = \frac{2665 (5b + 12)}{-261}$$
$$= -2 (5t + 12)$$

#### Simplify the following.

$$\frac{10y-4}{3} - \frac{2y+1}{6}$$

$$\frac{10y - 4}{3} - \frac{2y + 1}{6} = \frac{2(10y - 4)}{6} - \frac{2y + 1}{6}$$

$$= \frac{20y - 8 - (2t + 1)}{6}$$

$$= \frac{18y - 9}{6}$$

$$= \frac{3y(2y - 1)}{2 \cdot 6}$$

$$= \frac{9(2y - 1)}{6}$$

$$\frac{5x+3}{10} + \frac{2x-2}{4}$$

$$\frac{5x+3}{10} + \frac{2x-2}{4} = \frac{2(5x+3)}{20} + \frac{5(2x-2)}{20}$$

$$= \frac{10x+6+10x-10}{20}$$

$$= \frac{20x-4}{20}$$

$$= \frac{4(5x-1)}{520}$$

$$= \frac{5x-1}{5}$$

$$\frac{4m+2}{8} - \frac{1-m}{6}$$

$$\frac{4m+2}{8} - \frac{1-m}{6} = \frac{3(4m+2)}{24} - \frac{4(1-m)}{24}$$

$$= \frac{12m+6+4-4m}{24}$$

$$= \frac{8m+10}{24}$$

$$= \frac{2(4m+5)}{12 24}$$

$$= \frac{4m+5}{12}$$