RMIT UNIVERSITY

AF1.2: ALGEBRAIC FRACTIONS
(ADDITION & SUBTRACTION)

> Only fractions which have a *common denominator* may be added or subtracted.

Remember $\dfrac{7}{10} - \dfrac{3}{7} = \dfrac{7}{10} \cdot \dfrac{7}{7} - \dfrac{3}{7} \cdot \dfrac{10}{10}$ [70 is a common denominator as 7 and 10 are factors of 70]

$$= \dfrac{49}{70} - \dfrac{30}{70}$$ [Equivalent fractions are found with denominators of 70]

$$= \dfrac{49-30}{70}$$

$$= \dfrac{19}{70}$$

The process with algebraic fractions is very similar

Examples

1. $\dfrac{h}{6} + \dfrac{2h}{9} = \dfrac{h}{6} \cdot \dfrac{3}{3} + \dfrac{2h}{9} \cdot \dfrac{2}{2}$ [18 is a common denominator]

$$= \dfrac{3h}{18} + \dfrac{4h}{18}$$

$$= \dfrac{3h+4h}{18}$$

$$= \dfrac{7h}{18}$$

2. $\dfrac{e+1}{2} + \dfrac{e}{5} = \dfrac{e+1}{2} \cdot \dfrac{5}{5} + \dfrac{e}{5} \cdot \dfrac{2}{2}$ [10 is a common denominator]

$$= \dfrac{5(e+1)}{10} + \dfrac{2e}{10}$$

$$= \dfrac{5e+5+2e}{10}$$

$$= \dfrac{7e+5}{10}$$

3. $\dfrac{5}{2a} - \dfrac{3}{4} = \dfrac{5}{2a} \cdot \dfrac{2}{2} - \dfrac{3}{4} \cdot \dfrac{a}{a}$ ['4a' is a common denominator as 2, 'a' and 4 and are factors of 4a]

$= \dfrac{10}{4a} - \dfrac{3a}{4a}$

$= \dfrac{10 - 3a}{4a}$

Exercise

Simplify:

1   $\dfrac{4}{5} + \dfrac{3}{4}$

2   $\dfrac{x}{3} - \dfrac{x}{5}$

3   $\dfrac{2p}{7} - \dfrac{p}{4}$

4   $\dfrac{2g}{3} + \dfrac{g+1}{4}$

5   $\dfrac{d+3}{2} + \dfrac{1-d}{4}$

6   $\dfrac{5}{9} - \dfrac{3}{b}$

7   $\dfrac{3x+2}{5} - \dfrac{x-3}{10}$

8   $\dfrac{3}{v} + \dfrac{2}{v+1}$

Answers
Exercise

1   $\dfrac{31}{20}$

2   $\dfrac{2x}{15}$

3   $\dfrac{p}{28}$

4   $\dfrac{11g+3}{12}$

5   $\dfrac{d+7}{4}$

6   $\dfrac{5b-27}{9b}$

7   $\dfrac{5x+7}{10}$

8   $\dfrac{5v+3}{v(v+1)}$