Algebraic Fractions

Exercise A

1 Simplify the following.

(i) $\dfrac{2(x+3)}{4x+12}$

(ii) $\dfrac{4x-8}{(x-2)(x+8)}$

(iii) $\dfrac{3(x+y)}{x^2-y^2}$

(iv) $\dfrac{6x^2y^3}{9xy^4}$

(v) $\dfrac{2p}{6p-2p^2}$

(vi) $\dfrac{4ab^3}{10a^3b}$

(vii) $\dfrac{x^2-4x+3}{2x-6}$

(viii) $\dfrac{x^2+xy}{x^2-y^2}$

(ix) $\dfrac{a+2}{a^2-a-6}$

(x) $\dfrac{3x^2+15x}{10x+2x^2}$

(xi) $\dfrac{9x^2-1}{9x+3}$

(xii) $\dfrac{3x^2+3xy}{6xy+6y^2}$

2 Simplify the following.

(i) $\dfrac{3a}{b^2}\times\dfrac{b^3}{6a}$

(ii) $\dfrac{xy-y^2}{y}\times\dfrac{x}{x-y}$

(iii) $\dfrac{x+1}{2x}\div\dfrac{4x^2-4}{x^2}$

(iv) $\dfrac{3a^2+a-2}{2}\div\dfrac{6a^2-a-2}{8a+4}$

(v) $\dfrac{x^2-4x+4}{x^2-2x}\times\dfrac{x-2}{x^2-4}$

(vi) $\dfrac{2x-1}{x+1}\div\dfrac{2x^2-x-1}{x^2+3x+2}$

(vii) $\dfrac{4p^2+12}{p-3}\times\dfrac{p^2-9}{p^2+3}$

(viii) $\dfrac{3x^2-9}{x+2}\div\dfrac{x^2-6x+9}{x^2+x-2}$

3 Simplify the following.

(i) $\dfrac{3a}{5}-\dfrac{a}{4}$

(ii) $\dfrac{5}{3a}-\dfrac{4}{a}$

(iii) $\dfrac{2}{(m+n)}-\dfrac{1}{(m-n)}$

(iv) $\dfrac{4}{p-2}-\dfrac{3}{2p+1}$

(v) $\dfrac{2}{a^2+a}+\dfrac{3}{a^2-a}$

(vi) $\dfrac{2x}{x-y}+\dfrac{2y}{y-x}$

(vii) $\dfrac{p}{p^2-1}-\dfrac{1}{p+1}$

(viii) $\dfrac{a-b}{a+b}+\dfrac{a+b}{a-b}$

Exercise B

Simplify the following:

1. $\dfrac{3}{x+2} + \dfrac{2}{x+1}$

2. $\dfrac{2}{x-1} + \dfrac{5}{2x-1}$

3. $\dfrac{2x}{x+1} - \dfrac{3x}{x-1}$

4. $\dfrac{x-1}{(x+1)(x+2)} + \dfrac{x+3}{(x+2)(x-2)}$

5. $\dfrac{x+2}{(x+3)(x-1)} + \dfrac{2x}{(x+3)(x-2)}$

6. $\dfrac{3x+1}{(x-3)(x+1)} - \dfrac{x-2}{(x-3)(x+2)}$

7. $\dfrac{2}{(x-1)(x+2)} - \dfrac{3x-1}{(x+2)^2(x+1)}$

8. $\dfrac{x-3}{x^2(x+2)} + \dfrac{3}{x(x+1)}$

9. $\dfrac{2x-1}{(x-1)(x+3)^2} - \dfrac{x}{(x+2)(x+3)}$

10. $\dfrac{3x+2}{x(x-1)} - 4x$

Exercise C

Solve the following equations.

(i) $x - \dfrac{x}{5} = \dfrac{2}{3}$

(ii) $\dfrac{2}{a} - \dfrac{3}{4a} = 2$

(iii) $\dfrac{1}{x} = 3 - \dfrac{2}{x+1}$

(iv) $\dfrac{3x+2}{2} - \dfrac{x-1}{5} = 3$

(v) $\dfrac{2}{3x-1} + \dfrac{1}{x+8} = \dfrac{1}{2}$

(vi) $\dfrac{2}{a} - \dfrac{5}{2a-1} = 0$

(vii) $\dfrac{1}{p} + p + 1 = \dfrac{13}{3}$

(viii) $1 + \dfrac{1}{x-1} = \dfrac{2x}{x+1}$