Section 2: Rational expressions

Solutions to Exercise level 1

1. (i) $\dfrac{x^2-5x}{x-5}=\dfrac{x(x-5)}{x-5}=x$

(ii) $\dfrac{x^2+6x-16}{(x-2)(x-8)}=\dfrac{(x+8)(x-2)}{(x-2)(x-8)}=\dfrac{x+8}{x-8}$

(iii) $\dfrac{x^2-a^2}{(x-a)^2}=\dfrac{(x+a)(x-a)}{(x-a)^2}=\dfrac{x+a}{x-a}$

(iv) $\dfrac{v-3}{6-2v}=\dfrac{v-3}{2(3-v)}=\dfrac{-(3-v)}{2(3-v)}=-\dfrac{1}{2}$

2. (i) $\dfrac{x^2+3x-4}{8}\times\dfrac{2}{3x-3}=\dfrac{(x+4)(x-1)}{8}\times\dfrac{2}{3(x-1)}=\dfrac{x+4}{12}$

(ii) $\dfrac{3}{x+2}\times\dfrac{x^2-4x-12}{x^2-2x-24}=\dfrac{3}{x+2}\times\dfrac{(x-6)(x+2)}{(x-6)(x+4)}=\dfrac{3}{x+4}$

3. (i) $\dfrac{5c+15}{2}\div\dfrac{c^2-9}{4}=\dfrac{5c+15}{2}\times\dfrac{4}{c^2-9}$

$=\dfrac{5(c+3)}{2}\times\dfrac{4}{(c+3)(c-3)}$

$=\dfrac{10}{c-3}$

(ii) $\dfrac{x^2-x}{2x+1}\div\dfrac{x^2+2x-3}{2x^2-3x-2}=\dfrac{x^2-x}{2x+1}\times\dfrac{2x^2-3x-2}{x^2+2x-3}$

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

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

4. (i) $\dfrac{x}{2}+\dfrac{3x}{5}=\dfrac{5x}{10}+\dfrac{6x}{10}=\dfrac{11x}{10}$

(ii) $\dfrac{2}{3x}-\dfrac{1}{4x}=\dfrac{8}{12x}-\dfrac{3}{12x}=\dfrac{5}{12x}$