

# Sol. Part 1 of Unit 4 KVV

## Revision

$$\textcircled{6} \quad \frac{5(y-4)}{3(y+5)} \cdot \frac{7(y+5)}{10(y+4)}$$

$$= \frac{7(\cancel{y+5})}{3(\cancel{y+5})} \cdot \frac{5(y-4)}{10(y+4)}$$

$$= \frac{7(y-4)}{6(y+4)} ; y \neq -5, -4$$

$$\textcircled{7} \quad \frac{(x+8)(\cancel{x+2})}{(x-8)(\cancel{x+2})} \div \frac{\cancel{x+8}}{(x+8)(x-8)}$$

$$= \frac{x+8}{x-8} \cdot \frac{x-8}{1}$$

$$= x+8 ; x \neq -2, \pm 8$$

$$\textcircled{8} \quad \frac{3(x+1)}{6(x+2)} \cdot \frac{5(x+1)}{18}$$

$$= \frac{15(x+1)^2}{108(x+2)}$$

$$= \frac{5(x+1)^2}{36(x+2)}$$

$$\begin{matrix} x \neq -2 \\ x \neq -1 \end{matrix}$$

$$\textcircled{9} \quad \frac{(\cancel{x-5})(x+2)}{(\cancel{x-5})(2x-1)} \cdot \frac{(\cancel{x-3})(x-2)}{(\cancel{x-3})(2x-1)}$$

$$= \frac{x+2}{2x-1} \cdot \frac{2x-1}{x-2}$$

$$= \frac{x+2}{x-2} ; x \neq \frac{1}{2}, 2, 3, 5$$

$$\textcircled{10} \quad \frac{x(x+6)}{3(x+4)(x-2)} \cdot \frac{(x+4)(x-2)}{x+6}$$

$$\frac{x}{3}$$

$$\begin{matrix} x \neq -4 & x \neq 6 \\ x \neq 2 \end{matrix}$$

$$\textcircled{11} \quad \frac{(y+6)^2}{(y-6)(y+6)} \cdot \frac{3(\cancel{y+6})}{2(y+6)}$$

$$= \frac{3}{2}$$

$$y \neq 6, y \neq -6$$

$$\textcircled{12} \quad \frac{3}{(x+5)(x-2)} + \frac{1}{(x+5)(x+1)}$$

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

$$= \frac{4x+1}{(x+5)(x-2)(x+1)} ; x \neq -5, -1, 2$$

$$\textcircled{13} \quad \frac{x+2}{(x+2)^2} + \frac{2}{x+2}$$

$$= \frac{1}{x+2} + \frac{2}{x+2}$$

$$= \frac{3}{x+2} ; x \neq 2$$

$$\textcircled{14} \quad \frac{(3x-2)(x+2) + 5(x-2)}{(x-2)(x+2)}$$

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

$$= \frac{3x^2 + 9x - 14}{(x-2)(x+2)} ; x \neq \pm 2$$

$$\textcircled{15} \quad \frac{6(2) + 7(x)}{10x^2}$$

$$= \boxed{\frac{7x + 12}{10x^2}; x \neq 0}$$

$$\textcircled{16} \quad \frac{9}{(x-1)(x+1)} - \frac{x-2}{x+1}$$

$$= \frac{9 - (x-2)(x-1)}{(x-1)(x+1)}$$

$$= \frac{9 - x^2 + 3x - 2}{(x-1)(x+1)}$$

$$= \boxed{\frac{-(x^2 - 3x - 7)}{(x-1)(x+1)}; x \neq \pm 1}$$

$$\textcircled{17} \quad \frac{x}{(x+3)(x+2)} + \frac{-2}{(x+2)(x+1)}$$

$$= \frac{x^2 + x}{(x+3)(x+2)(x+1)} + \frac{-2x - 6}{(x+3)(x+2)(x+1)}$$

$$= \frac{x^2 - x - 6}{(x+3)(x+2)(x+1)}$$

$$\downarrow$$

$$\frac{(x-3)(x+2)}{(x+3)(x+2)(x+1)}$$

$$\boxed{\frac{x-3}{(x+3)(x+1)}}$$

$x \neq -3$   
 $x \neq -2$   
 $x \neq -1$

$$\textcircled{18} \quad \frac{x(x-10)}{6(2x+1)}$$

$x \neq -\frac{1}{2}$   
 $x \neq 0$

$$\textcircled{19} \quad \frac{20}{x+1} \div \frac{1}{4} - \frac{7}{x+1}$$

$$= \frac{20}{x+1} \cdot \frac{(x+1) - 7(4)}{4(x+1)}$$

$$= \frac{20}{x+1} \cdot \frac{4x+1}{x-27}$$

$$= \boxed{\frac{80}{x-27}}; x \neq -1, 27$$

$$\textcircled{20} \quad \frac{4}{(x-3)(x+3)} + \frac{2(x+3)}{(x-3)(x+3)}$$

$$\frac{x-3}{(x-3)(x+3)} + \frac{(x+3)}{(x-3)(x+3)}$$

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

$$= \frac{2x + 10}{2 \cdot 2x} = \boxed{\frac{x+5}{x}}$$

$x \neq 0$   
 $x \neq 3$   
 $x \neq -3$

$$\textcircled{18} \quad \left(\frac{x-10}{2}\right) \div \left(\frac{6x+3}{x}\right)$$

$$\left(\frac{x-10}{2}\right) \cdot \left(\frac{x}{6x+3}\right)$$

$$\frac{x-10}{2} \cdot \frac{x}{6x+3}$$

$$\frac{x(x-10)}{2(6x+3)} \Rightarrow \boxed{\frac{x(x-10)}{6(2x+1)}}$$

$\uparrow$  GCF 3

$$(21) \quad \frac{1}{3}(3x+7) = 5(2x-4)$$

$$9x+21 = 10x-20$$

$$\boxed{41 = x}$$

$x \neq 2$   
 $x \neq \frac{7}{3}$

$$(22) \quad 12x^2 = 4x^2 - 16x$$

$$8x^2 + 16x = 0$$

$$8x(x+2) = 0$$

$$\boxed{x = -2, 0}$$

$x \neq 0$

$$(23) \quad \frac{7}{x^2-5x} + \frac{2}{x} = \frac{3}{2x-10}$$

$$\frac{7}{x(x-5)} + \frac{2}{x} - \frac{3}{2(x-5)} = 0$$

$$\frac{7(2) + 2(2(x-5)) - 3(x)}{2x(x-5)} = 0$$

$$14 + 4x - 20 - 3x = 0 \quad x \neq 5$$

$$x - 6 = 0$$

$$x = 6$$

$$(24) \quad \frac{x+2}{x-1} + \frac{4}{x-5} - \frac{6}{(x+5)(x-1)} = 0$$

$$(x+2)(x-5) + 4(x-1) - 6 = 0;$$

$$x^2 - 3x - 10 + 4x - 4 - 6 = 0$$

$$x^2 + x - 20 = 0$$

$$(x+5)(x-4) = 0$$

$$\boxed{x = -5, 4}$$

$x \neq 1$   
 $x \neq 5$

$$(25) \quad 5(x-2) + x(x+2) - 8 = 0; \quad x \neq \pm 2$$

$$5x - 10 + x^2 + 2x - 8 = 0$$

$$x^2 + 7x - 18 = 0$$

$$(x+9)(x-2) = 0$$

$$x = 2, -9$$

$$\boxed{x = -9}$$

$$(26) \quad \frac{4x}{x+3} + x = \frac{8}{x+3} (x+3)$$

$$4x + x^2 + 3x = 8$$

$$x^2 + 7x - 8 = 0$$

$$(x+8)(x-1) = 0$$

$$\boxed{x = -8 \quad x = 1}$$


$x \neq -3$

(27)  $2|x-5|-1 < 11$

$$|x-5| < 6$$

$$x-5 < 6 \text{ and } x-5 > -6$$

$x < 11$  and  $x > -1$



(28)

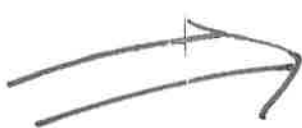
$$y = -\frac{3}{2}x - 4$$

$$\downarrow$$
$$x = -\frac{3}{2}y - 4$$

$$2(x+4) = -\frac{3}{2}y \quad (2)$$

$$\frac{2x+8}{-3} = -\frac{3y}{3}$$

$$\frac{2x+8}{-3} = y$$



$$y = \frac{-2x-8}{3}$$

$$f^{-1}(x) = \frac{-2x-8}{3}$$

OR

$$f^{-1}(x) = -\frac{2}{3}x - \frac{8}{3}$$

(29)

$$x = 4, \frac{2}{3}, -3$$

↙ double root

$$y = (x-4)(3x-2)(x+3)^2$$