

(2)

$$\frac{3}{y^2 - 9y} + \frac{-2}{y^2 - 8y - 9}$$

$$\frac{3}{y(y-9)} + \frac{-2}{\cancel{(y-9)(y+1)}}$$

$$\begin{aligned} \text{LCD} &= \text{GCF} \cdot \text{rest} \\ &= (y-9)(y)(y+1) \end{aligned}$$

$$\frac{3}{y(y-9)} \cdot \frac{(y+1)}{(y+1)} + \frac{-2}{\cancel{(y-9)(y+1)}} \cdot \frac{y}{y}$$

$$\frac{3y+3}{\text{LCD}} + \frac{-2y}{\text{LCD}}$$

$$\frac{1y+3}{\text{LCD}} = \boxed{\frac{y+3}{y(y+1)(y-9)}}$$

$$\textcircled{4} \quad \frac{t}{t^2-2s} + \frac{-1}{t^2-10t+2s}$$

$$t^2-2s = \text{dots} = (t-s)(t+s)$$

$$t^2-10t+2s = \text{pst} = (t-s)(t-s)$$

$$\frac{t}{(t-s)(t+s)} + \frac{-1}{(t-s)(t-s)}$$

$$\text{LCD} = \text{GCF} \cdot \text{rest}$$

$$= \underline{(t-s)} (t-s) (t+s)$$

$$\frac{t}{(t-s)(t+s)} \frac{(t-s)}{(t-s)} + \frac{-1}{(t-s)(t-s)} \frac{(t+s)}{(t+s)}$$

$$\frac{\frac{t^2-st}{\text{LCD}} + \frac{-t-s}{\text{LCD}}}{\text{LCD}} = \frac{t^2-6t-s}{\text{LCD}}$$

$$\boxed{\frac{t^2-6t-s}{(t-s)(t-s)(t+s)}} \leftarrow \text{not factorable}$$

$$\begin{array}{c} \text{S} \\ \left( \begin{array}{cccc} 1 & -6 & -s \\ 1 & s & -s \\ 1 & -1 & E10 \end{array} \right) \\ \text{S} \\ \left( \begin{array}{cccc} 1 & -6 & -s \\ -s & -s & ss \\ 1 & -11 & so \end{array} \right) \end{array}$$

$$\textcircled{6} \quad \frac{V}{2V^2+7V-4} + \frac{2}{2V^2-9V+4}$$

$$\underline{\text{AC method}} \quad 2V^2+7V-4$$

$$\begin{array}{r} -8V^2 \\ \hline 1V 8V \end{array} \quad \begin{array}{r} - \\ +7V \\ \hline 2V \end{array}$$

$$\begin{aligned} 2V^2+8V-1V-4 \\ 2V(V+4)-1(V+4) \\ (V+4)(2V-1) \end{aligned}$$

$$2V^2+7V-4 = (2V-1)(V+4)$$

$$\underline{\text{AC Method}}$$

$$\begin{array}{r} +8V^2 \\ \hline 1V 8V \\ \hline -9V \\ \hline 6V \end{array} \quad \begin{array}{r} 2V \\ 2V \end{array}$$

$$\begin{aligned} 2V^2-9V+4 \\ 2V^2-8V-1V+4 \\ 2V(V-4)-1(V-4) \\ (V-4)(2V-1) \end{aligned}$$

$$\frac{V}{(2V-1)(V+4)} + \frac{2}{(2V-1)(V-4)}$$

⑥ cont

$$\frac{v}{(2v-1)(v+4)} + \frac{2}{(2v-1)(v-4)}$$

$$LCD = GCF \cdot \text{rest}$$

$$= \underline{6v-1} (v+4)(v-4)$$

$$\frac{v}{(2v-1)(v+4)} \cdot \frac{(v-4)}{(v-4)} + \frac{2}{(2v-1)(v-4)} \cdot \frac{(v+4)}{(v+4)}$$

$$\frac{v^2 - 4v}{LCD} + \frac{2v + 8}{LCD}$$

$$\left( \frac{v^2 - 2v + 8}{(2v-1)(v+4)(v-4)} \right) \leftarrow \text{not factorable}$$

$$\begin{array}{r} -4 \\ \hline 1 & -2 & 8 \\ -4 & & 24 \\ \hline 1 & -6 & 32 \end{array}$$

$$2v-1 \left[ \begin{array}{r} v^2 - 2v + 8 \\ -1^2 + \frac{1}{2}v \\ \hline -\frac{3}{2}v + 8 \end{array} \right] \quad \frac{\frac{1}{2}v - \frac{3}{4}}{2v-1}$$

$2v-1$   
not a-factor

$$\begin{array}{r} 4 \\ \hline 1 & -2 & 8 \\ 4 & & 8 \\ \hline 1 & 2 & 16 \end{array}$$

$x+4$   
 $x-4$  not factors

$$\textcircled{8} \quad \frac{3}{x^3 - 4x^2} + \frac{2}{x^3 - 8x^2 + 16x}$$

$$\frac{3}{x^2(x-4)} + \frac{2}{x(x^2 - 8x + 16)}$$

Note  $x^2 - 8x + 16 = \text{PST} = (x-4)(x-4)$

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

LCD = GCF, rest

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

Stack method

$x^2(x-4)$	$= xx(x-4)$
$\times (x^2 - 8x + 16)$	$\underline{x(x-4)(x-4)}$
	$xx(x-4)(x-4)$

LCD  $(x^2(x-4))(x-4)$

$$x^2(x-4)(x-4)$$

⑥ cont

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

$$\frac{3x-12}{LCD} + \frac{2x}{LCD}$$

$$\boxed{\frac{5x-12}{x^2(x-4)(x-4)}}$$

$$\textcircled{10} \quad \frac{x}{x^2 - y^2} + \frac{y}{x^2 - 4xy - 5y^2}$$

$$x^2 - y^2 = \text{dots} = (x-y)(x+y)$$

Note  $m^2 - 4m - 5 = (m-5)(m+1)$

$$\begin{array}{r} x - 3y \\ \hline x-y \longdiv{ x^2 - 4xy - 5y^2 } \\ -x^2 + 1xy \\ \hline -3xy - 5y^2 \\ + 3xy - 3y^2 \\ \hline -8y^2 \end{array}$$

$(x-y)$   
is a factor

$$\begin{array}{r} x - 5y \\ \hline x+y \longdiv{ x^2 - 4xy - 5y^2 } \\ -x^2 - 1xy \\ \hline -5xy - 5y^2 \\ 5xy + 5y^2 \\ \hline 0 \end{array}$$

$x - 5y$   
is a factor

10 cont

$$x^2 - 4xy - 5y^2 = (x+y)(x-5y)$$

so

$$\frac{x}{(x-y)(x+y)} + \frac{y}{(x+y)(x-5y)}$$

LCD = GCF · rest

$$\frac{x}{(x-y)(x+y)} \frac{(x-5y)}{(x-5y)} + \frac{y}{(x+y)(x-5y)} \frac{(x-y)}{(x-y)}$$

$$\frac{x^2 - 5xy}{LCD} + \frac{xy - y^2}{LCD}$$

$$\frac{x^2 - 4xy - y^2}{(x-y)(x+y)(x-5y)}$$

not factorable