09a Quiz 8

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

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

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

$= \dfrac{x^2-x-6+2x^2-7x+6}{LCD} = \dfrac{3x^2-8x}{LCD} = \boxed{\dfrac{x(3x-8)}{(x-3)(x-2)(x+2)}}$

If you missed the cancellation, early, you Should get $\dfrac{x(3x-8)(x-1)}{(x-1)(x-3)(x-2)(x+2)}$ & cancel $x-1$ @ the end.

② $\dfrac{2x^{-3}+2y^{-2}}{5x^{-2}-3y^{-1}} = \dfrac{\frac{2}{x^3}+\frac{2}{y^2}}{\frac{5}{x^2}-\frac{3}{y}} = \dfrac{\frac{2}{x^3}\cdot\frac{y^2}{y^2}+\frac{2}{y^2}\cdot\frac{x^3}{x^3}}{\frac{5}{x^2}\cdot\frac{y}{y}-\frac{3}{y}\cdot\frac{x^2}{x^2}}$

$= \dfrac{\frac{2y^2+2x^3}{x^3y^2}}{\frac{5y-3x^2}{x^2y}} = \dfrac{2y^2+2x^3}{x^3y^2}\cdot\dfrac{x^2y}{5y-3x^2} = \boxed{\dfrac{2y^2+2x^3}{xy(5y-3x^2)}}$

③

-2	5	-24	14	0	11	7
		-10	68	-164	328	-678
	5	-34	82	-164	339	-671

$5x^5-24x^4+14x^3+11x+7 = (x+2)(5x^4-34x^3+82x^2-164x+339)-671$

④ $P(-2) = -671$

899

Quiz 8

Add This version of #1, I found a cancellation

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

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

$$= \frac{x^2-x-6+2x^2-4x-3x+6}{LCD} = \frac{3x^2-8x}{LCD} = \frac{x(3x-8)}{LCD}$$

(5)

$$\begin{array}{r} 4x^3-2x^2-8x+9 \\ x^2+2 \overline{)\,4x^5-2x^4+0x^3+5x^2-11x-3} \\ -(4x^5 \qquad +8x^3) \\ \hline -2x^4-8x^3+5x^2-11x-3 \\ -(-2x^4 \qquad -4x^2) \\ \hline -8x^3+9x^2-11x-3 \\ -(-8x^3 \qquad -16x) \\ \hline 9x^2+5x-3 \\ -(9x^2 \qquad +18) \\ \hline 5x-21 \end{array} \qquad \text{r } 5x-21$$

$$\rightarrow \quad \boxed{4x^5-2x^4+5x^2-11x-3 = (x^2+2)(4x^3-2x^2-8x+9)+5x-21}$$

099 Quiz 8

(6) $\frac{7}{x+5} + \frac{8}{x+2} = \frac{9}{x+1}$, LCD $= (x+5)(x+2)(x+1)$

$$\left(\frac{7}{x+5}\right)\left(\frac{(x^2+3x+2)}{(x+2)(x+1)}\right) + \left(\frac{8}{x+2}\right)\left(\frac{x^2+6x+5}{(x+5)(x+1)}\right) = \left(\frac{9}{x+1}\right)\left(\frac{x^2+7x+10}{(x+2)(x+5)}\right)$$

$$\Rightarrow \frac{7x^2+21x+14+8x^2+48x+40}{\text{LCD}} = \frac{9x^2+63x+90}{\text{LCD}}$$

$$\Rightarrow 15x^2+69x+54 = 9x^2+63x+90$$

$$-9x^2-63x-90 \qquad -9x^2-63x-90$$

$$6x^2+6x-36 = 0$$

$$x^2+x-6 = 0$$

$$(x+3)(x-2) = 0$$

$x = -3$ OR $x = 2$ → $x=-2$ would've been a problem! Yes, it is!

→ Not in domain

$\Rightarrow$ ~~$x \in \{-3\}$~~

$x \in \{-3, 2\}$