1) $\dfrac{3x+5}{6x^2+3x} + \dfrac{4x^2+9}{4x^2-1} = \dfrac{x+3/2}{3x} - \dfrac{8}{3}\,\dfrac{x^2}{1-4x^2}$;

$$\frac{3x+5}{3x(2x+1)} + \frac{4x^2+9}{(2x-1)(2x+1)} - \frac{2x+3}{6x} - \frac{8x^2}{3(2x-1)(2x+1)} = 0$$

$$\frac{2(2x-1)(3x+5)+6x(4x^2+9)-(2x+1)(2x-1)(2x+3)-16x^3}{\cancel{6x(2x+1)(2x-1)}} = 0$$

C.E. : $\cancel{6}x(2x+1)(2x-1) \neq 0$

$x \neq 0$; $x \neq -1/2$; $x \neq 1/2$

$2(6x^2+10x-3x-5)+24x^3+54x-(4x^2-1)(2x+3)-16x^3=0$

$\cancel{12x^2}+20x-6x-10+\cancel{24x^3}+54x-\cancel{8x^3}-\cancel{12x^2}+2x+3-\cancel{16x^3}=0$

$70x-7=0$; $\dfrac{\cancel{70}x}{\cancel{70}} = \dfrac{7}{70}$; $x = \dfrac{1}{10}$

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2) $3x^2+5x+7+\dfrac{2x^3+3x+16}{x^2+x}-\dfrac{10x^3+12x+4}{x}-\dfrac{2+7x^3}{x+1}$

$$3x^2+5x+7+\frac{2x^3+3x+16}{x(x+1)}-\frac{10x^3+12x+4}{x}+\frac{2+7x^3}{x+1}=0$$

$$\frac{(3x^2+5x+7)(x^2+x)+2x^3+3x+16-(x+1)(10x^3+12x+4)+2x+7x^4}{\cancel{x(x+1)}}=0$$

C.E. : $x(x+1)\neq 0$ $\nearrow$ $x\neq 0$ $\searrow$ $x\neq -1$

$$\cancel{3x^4}+\cancel{3x^3}+\cancel{5x^3}+\cancel{5x^2}+\cancel{7x^2}+7x+\cancel{2x^3}+3x+16-\cancel{10x^4}-\cancel{12x^2}-4x-\cancel{10x^3}-12x-4+$$
$$+2x+\cancel{7x^4}=0$$

$-4x+12=0$; $-4x=-12$

$x=3$

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