Solutions +/- Quiz Rationals

① $\frac{1}{8x} + \frac{7}{20x^2} = \frac{1}{8x}\cdot\frac{5x}{5x} + \frac{7}{20x^2}\cdot\frac{2}{2} = \boxed{\frac{5x+14}{40x^2}}$

LCD $2\cdot2\cdot2\cdot5\cdot x$

$\frac{2\,2\,x\,x\,5}{2\cdot2\cdot2\,x\,x\,5} = \boxed{40x^2} \rightarrow$ LCD

② $\frac{6x}{x-2} - \frac{x+3}{x+5} = \frac{6x}{x-2} + \frac{-(x+3)}{(x+5)}$

$\boxed{\text{LCD } (x-2)(x+5)}$

$\frac{6x}{(x-2)}\frac{(x+5)}{(x+5)} + \frac{-(x+3)}{(x+5)}\frac{(x-2)}{(x-2)}$

$\frac{6x^2+30x}{LCD} + \frac{-1(x^2+3x-2x-6)}{LCD}$

$\frac{6x^2+30x}{LCD} + \frac{-1(x^2+1x-6)}{LCD}$

$\frac{6x^2+30x}{LCD} + \frac{-x^2-x+6}{LCD}$

$\boxed{\frac{5x^2+29x+6}{(x-2)(x+5)}}$

$= \boxed{\frac{5x^2+29x+6}{x^2+3x-10}}$

2| 5 29 6
10 78
5 39 |84

-5| 5 29 6
-25 -70
5 4 |-14

Solutions to +/- Quiz Rationals

(3) $\frac{2}{5x^2-45} + \frac{4}{3x^2+4x-15} = \frac{2}{5(x^2-9)} + \frac{4}{(3x-5)(x+3)}$

Groupings

$-45x^2$

$1x \quad 45x$

$3x \quad 15x$

$5x \quad 9x \rightarrow 4x$

$3x^2+9x-5x-15$

$3x(x+3)-5(x+3)$

$(x+3)(3x-5)$

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

$LCD\left(5(x+3)(x-3), (3x-5)(x+3)\right) =$

$5(x-3)(x+3)$

$(x+3)(3x-5)$

$\boxed{5(x-3)(x+3)(3x-5)}$

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

$\frac{6x-10}{LCD} + \frac{20x-60}{LCD} = \boxed{\frac{26x-70}{5(3x-5)(x+3)(x-3)}}$

Solutions 7/- Rational Quiz

(4) $\frac{3}{x^2-9x+20} - \frac{7}{x^2-7x+14}$

$\frac{3}{(x-4)(x-5)} + \frac{-7}{x^2-7x+14}$

prime

14: 1, 14; 15 or 16

$\text{LCD}(x^2-9x+20,\ x^2-7x+14) = (x^2-9x+20)(x^2-7x+14)$

14: 2, 7; 9 or 5

$\frac{3}{(x^2-9x+20)} \cdot \frac{(x^2-7x+14)}{(x^2-7x+14)} + \frac{-7(x^2-9x+20)}{\text{LCD}}$

$\frac{3x^2-21x+42}{\text{LCD}} \quad \frac{-7x^2+63x-140}{\text{LCD}}$

$\frac{-4x^2+42x-98}{(x-4)(x-5)(x^2-7x+14)} = \frac{-2(2x^2-21x+49)}{(x-4)(x-5)(x^2-7x+14)}$

98: 1, 98; 2, 49; 7, 14

$2x^2-7x-14x+49$

$x(2x-7)-2(2x-7)$

$(x-2)(2x-7)$

$\frac{-2(x-7)(2x-7)}{(x-4)(x-5)(x^2-7x+14)}$

Solutions to Rational Quiz

⑤ $\frac{5}{5x+25} + \frac{4x}{2x^2-18} = \frac{5}{5(x+5)} + \frac{4x}{2(x^2-9)}$

$LCD = (5(x+5), 2(x^2-9)) = 10(x+5)(x^2-9)$

$= (5x+25)(2x^2-18)$

$\frac{5}{5x+25} \cdot \frac{2x^2-18}{2x^2-18} + \frac{4x}{2x^2-18} \cdot \frac{5x+25}{5x+25}$

$\frac{10x^2-90}{LCD} + \frac{20x^2+100x}{LCD} = \boxed{\frac{30x^2+100x-90}{(5x+25)(2x^2-18)}}$

↙ not simplified

$\frac{30x^2+100x-90}{5(x+5)(2)(x^2-9)} = \frac{10(3x^2+10x-9)}{10(x+5)(x-3)(x+3)}$

$= \boxed{\frac{3x^2+10x-9}{(x+5)(x-3)(x+3)}}$

↙ simplified

Solutions +/- Quiz over Rationals

(6) $\frac{1}{2x-18} - \frac{5}{x+9} + \frac{4}{x^2-81} = \frac{1}{2(x-9)} + \frac{-5}{x+9} + \frac{4}{(x-9)(x+9)}$

$LCD\{(2x-18), (x+9), (x^2-81)\} = 2(x+9)(x-9)$

$2(x-9)$

$(x-9)(x+9)$

$x+9$

$\boxed{2(x-9)(x+9)} \rightarrow LCD$

$\frac{1}{2(x-9)}\frac{(x+9)}{(x+9)} + \frac{-5(2(x-9))}{(x+9)(2(x-9))} + \frac{4}{(x-9)(x+9)}\frac{(2)}{(2)}$

$\frac{x+9}{LCD} + \frac{-10x+90}{LCD} + \frac{8}{LCD}$

$\boxed{\frac{-9x+107}{2(x-9)(x+9)}} = \boxed{\frac{-9x+107}{2x^2-162}}$