High Level Algebra:

Q.1: $\frac{4-3x}{5} - \frac{3x-5}{2} = -3$

Sol $\frac{4-3x}{5} - \frac{3x-5}{2} = -3$

$5\overline{)10}^{\,2}$ $\quad 10$ $\quad x$

$5\times2=10$

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

$2\overline{)10}^{\,5}$ $\quad 10$ $\quad x$

$= 2(4-3x)-5(3x-5) = -3\times10$

$= 8-6x-15x+25 = -30$

$= -21x+33 = -30$

$21\overline{)63}^{\,3}$ $\quad 63$ $\quad x$

$= -21x = -30-33$

$= \cancel{-}21x = \cancel{-}63 \Rightarrow 21x = 63$

$= \frac{\cancel{21}x}{\cancel{21}} = \frac{63}{21} \Rightarrow \boxed{x=3}$

Q.2: $\frac{x^2-7x+12}{4x-x^2}$

-4, -3 } -7; 12

Sol $\frac{x^2-7x+12}{4x-x^2} \Rightarrow \frac{x^2-4x-3x+12}{x(4-x)}$

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

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

$= \frac{(x-3)}{-x} \Rightarrow \boxed{-\frac{(x-3)}{x}}$

Q.3: $\frac{6x^3+13x^2-5x}{4x^2-25}$

Sol $\frac{6x^3+13x^2-5x}{4x^2-25} = \frac{x(6x^2+13x-5)}{2^2x^2-5^2}$

$4=2^2$
$25=5^2$

$\Rightarrow \frac{x(6x^2+13x-5)}{(2x)^2-5^2}$

$6 \times -5 = -30$

$= \frac{x(6x^2+15x-2x-5)}{(2x)^2-5^2}$ ← $\because a^2-b^2 = (a-b)(a+b)$

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

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

Q.4: Express $\frac{1}{9x^2-25} - \frac{1}{6x+10}$ as a single fraction in its simplest form.

Sol $\frac{1}{9x^2-25} - \frac{1}{6x+10}$

$9=3^2$
$25=5^2$
$a^2-b^2=$
$(a+b)(a-b)$

$= \frac{1}{(3x)^2-5^2} - \frac{1}{6x+10}$

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

$= \frac{2\times1 - 1\times 3x-5}{2(3x+5)(3x-5)}$

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

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

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