More Solving Rational Equations

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

LCM: $2x(x+1)$

$2x(x+1)\left[\frac{3x}{x+1} - \frac{5}{2x} = \frac{3}{2x}\right]$

$3x(2x) - 5(x+1) = 3(x+1)$

$6x^2 - 5x - 5 = 3x + 3$

$6x^2 - 8x - 8 = 0$

$2(3x^2 - 4x - 4) = 0$

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

$3x + 2 = 0$ $\quad x - 2 = 0$

$3x = -2$ $\quad x = 2$

$x = -\frac{2}{3}$

2. $\frac{7}{x-1} - 5 = \frac{6}{x^2-1}$

$\frac{7}{x-1} - 5 = \frac{6}{(x-1)(x+1)}$

LCM: $(x-1)(x+1)$

$(x-1)(x+1)\left[\frac{7}{x-1} - 5 = \frac{6}{(x-1)(x+1)}\right]$

$7(x+1) - 5(x-1)(x+1) = 6$

$7x + 7 - 5(x^2 - 1) = 6$

$7x + 7 - 5x^2 + 5 = 6$

$-5x^2 + 7x + 12 = 6$

$0 = 5x^2 - 7x - 6$

$0 = (5x+3)(x-2)$

$5x + 3 = 0$ $\quad x - 2 = 0$

$5x = -3$ $\quad x = 2$

$x = -\frac{3}{5}$