Algebraic Fractions

1) Solve $\frac{2x+1}{2} - \frac{x+1}{7} = 1$

$$\frac{14(2x+1)}{2} - \frac{14(x+1)}{7} = 14$$

$$7(2x+1) - 2(x+1) = 14$$

$$14x + 7 - 2x - 2 = 14$$

$$12x = 14 - 5$$

$$12x = 9$$

$$x = \frac{9}{12}$$

$$\underline{x = \frac{3}{4}}$$

2) Solve $\frac{3x+1}{5} - \frac{5x-1}{7} = 0$

$$\frac{35(3x+1)}{5} - \frac{35(5x-1)}{7} = 0$$

$$7(3x+1) - 5(5x-1) = 0$$

$$21x + 7 - 25x + 5 = 0$$

$$-4x = -12$$

$$x = \frac{-12}{-4}$$

$$\underline{x = 3}$$

3) Write $3 + \frac{x+1}{x+2} - \frac{2x+1}{x-2}$ in form $\frac{ax^2+bx+c}{x^2-4}$

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

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

$$= \frac{3x^2-12 + x^2-x-2 - 2x^2-x-4x-2}{x^2-4}$$

$$= \frac{2x^2-6x-16}{x^2-4}$$