6. $2 + \frac{x+1}{2} = \frac{x-5}{9}$

$18(2) + \cancel{18}^{9}\left(\frac{x+1}{\cancel{2}_{1}}\right) = \cancel{18}^{2}\left(\frac{x-5}{\cancel{9}_{1}}\right)$

$36 + 9x + 9 = 2x - 10$

$9x + 45 = 2x - 10$

$9x - 2x = -10 - 45$

$7x = -55$

$\frac{\cancel{7}x}{\cancel{7}} = \frac{-55}{7}$

$x = -\frac{55}{7}$

7. $\frac{5}{4x} - \frac{3}{2} = \frac{1}{9} - \frac{2}{3x}$

$\cancel{36}^{9}x\left(\frac{5}{\cancel{4x}_{1}}\right) - \cancel{36}^{18}x\left(\frac{3}{\cancel{2}_{1}}\right) = \cancel{36}^{4}x\left(\frac{1}{\cancel{9}_{1}}\right) - \cancel{36}^{12}x\left(\frac{2}{\cancel{3x}_{1}}\right)$

$9(5) - 18x(3) = 4x(1) - 12(2)$

$45 - 54x = 4x - 24$

$-54x - 4x = -24 - 45$

$-58x = -69$

$\frac{\cancel{-58}x}{\cancel{-58}} = \frac{-69}{-58}$

$x = \frac{69}{58}$

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

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

$5 - x + 2 = -3$

$-x + 7 = -3$

$-x = -3 - 7$

$-x = -10$

$\frac{\cancel{-}x}{\cancel{-1}} = \frac{-10}{-1}$

$x = 10$