

1) a) $\frac{9}{5} - \frac{4}{3} = \frac{27}{15} - \frac{20}{15} = \frac{7}{15}$ b) $\frac{5}{6} \left(\frac{3}{7} - 3 \right) = \frac{5}{6} \left(\frac{3}{7} - \frac{21}{7} \right) = \frac{5 \cdot (-18)}{6 \cdot 7} = -\frac{15}{7}$
 c) $\left(4 - \frac{11}{4} \right) : \frac{9}{8} = \left(\frac{16}{4} - \frac{11}{4} \right) \cdot \frac{8}{9} = \frac{5 \cdot 8}{4 \cdot 9} = \frac{10}{9}$ d) $\left(\frac{4}{9} - 5 \right) : \left(\frac{7}{18} + \frac{2}{3} \right) = \frac{4-45}{9} \cdot \frac{18}{7+12} = -\frac{41 \cdot 18}{9 \cdot 19} = -\frac{82}{19}$
 e) $\left(\frac{13}{6} - \frac{11}{8} \right) \cdot \frac{5}{12} : \left(\frac{7}{5} - 2 \right) = \frac{52-33}{24} \cdot \frac{12}{5} \cdot \frac{5}{7-10} = \frac{19 \cdot 12 \cdot 5}{24 \cdot 5 \cdot (-3)} = -\frac{19}{6}$

2) **Löse** die quadratische Gleichung $x^2 - \frac{1}{6}x - \frac{1}{3} = 0$! (Lösungsformel: $x_{1,2} = -\frac{p}{2} \pm \sqrt{\left(\frac{p}{2}\right)^2 - q}$)
 $x_{1,2} = \frac{1}{12} \pm \sqrt{\frac{1}{144} + \frac{48}{144}} = \frac{1}{12} \pm \frac{7}{12} \rightarrow \underline{\underline{x_1 = \frac{8}{12} = \frac{2}{3}}}$ und $\underline{\underline{x_2 = -\frac{6}{12} = -\frac{1}{2}}}$

3) a) $3 - \frac{4}{2x-5} = \frac{3(2x-5)-4}{2x-5} = \frac{6x-15-4}{2x-5} = \frac{6x-19}{2x-5}$ b) $\frac{3x-2}{4} - \frac{3-x}{6} = \frac{3(3x-2)-2(3-x)}{12} = \frac{9x-6-6+2x}{12} = \frac{11x-12}{12}$
 c) $\frac{2x}{1-2x} + \frac{5}{4x-2} - \frac{3}{4} = \frac{2x}{-(2x-1)} + \frac{5}{2(2x-1)} - \frac{3}{4} = \frac{-4 \cdot 2x + 5 \cdot 2 - 3(2x-1)}{4(2x-1)} = \frac{-8x+10-6x+3}{4(2x-1)} = \frac{-14x+13}{4(2x-1)}$
 d) $\frac{3}{x^2-16} - \frac{2x}{x+4} + \frac{2-x}{x-4} = \frac{3-2x(x-4)+(2-x)(x+4)}{(x+4)(x-4)} = \frac{3-2x^2+8x+2x+8-x^2-4x}{(x+4)(x-4)} = \frac{-3x^2+6x+11}{(x+4)(x-4)}$
 e) $\frac{3x}{9-4x^2} + \frac{4-2x}{2x+3} - 5 = \frac{-3x+(4-2x)(2x-3)-5(4x^2-9)}{(2x+3)(2x-3)} = \frac{-3x+8x-12-4x^2+6x-20x^2+45}{(2x+3)(2x-3)} = \frac{-24x^2+11x+33}{(2x+3)(2x-3)}$