Simplifying Complex Fractions

① $\dfrac{\frac{25}{2}}{\frac{4}{15}}$ CD: 15 → $\dfrac{375}{6-4}$ → $\dfrac{375}{2}$ or 187.5

② $\dfrac{\frac{9}{4}-\frac{4}{3}}{9}$ CD: 36 → $\dfrac{81-48}{324}$ → $\dfrac{33}{324}$ *reduce! → $\dfrac{11}{108}$

③ $\dfrac{\frac{2}{x}}{\frac{4}{a}+\frac{1}{3}}$ CD: 3a → $\dfrac{6}{12+a}$

④ $\dfrac{\frac{16}{u^2}-\frac{4u}{3}}{\frac{u^2}{1}\cdot\frac{3u^2}{1}}$ CD: $3u^2$ → $\dfrac{48-4u^3}{3u^3}$

⑤ $\dfrac{\frac{6}{m}-\frac{3}{2}}{\frac{m}{16}}$ CD: 16m → $\dfrac{96-24m}{m^2}$

⑥ $\dfrac{\frac{x-5}{16}+\frac{1}{4}}{\frac{1}{x}}$ CD: 16x → $\dfrac{x^2-5x+4x}{16}$ → $\dfrac{x^2+x}{16}$

⑦ $\dfrac{\frac{u}{4}-\frac{1}{5}}{\frac{1}{5}-\frac{4}{(3u-5)}}$ CD: $20(3u-5)$ → $\dfrac{5u(3u-5)-4(3u-5)}{4(3u-5)-4(20)}$ * now distribute & combine like terms

$\dfrac{15u^2-25u-12u+20}{12u-20-80}$ → $\dfrac{15u^2-37u+20}{12u-100}$

⑧ $\dfrac{\frac{1}{u}-\frac{2u}{3}}{\frac{u}{2}+\frac{9}{4}}$ CD: 12u → $\dfrac{12-8u^2}{6u^2+27u}$ * you can factor but nothing will cancel so you don't have to factor

$\dfrac{4(3-2u^2)}{3u(2u+9)}$

⑨ $\dfrac{\frac{4}{a+5}-\frac{a}{16}}{\frac{a+5}{16}-\frac{3}{8}}$ CD: 16(a+5) → $\dfrac{64-a(a+5)}{(a+5)(a+5)-6(a+5)}$ * now distribute & combine like terms

$\dfrac{64-a^2-5a}{a^2+10a+25-6a-30}$ → $\dfrac{64-a^2-5a}{a^2+4a-5}$ * you can factor but nothing cancels so you don't have to

$\dfrac{64-a^2-5a}{(a-5)(a-1)}$

10) $\dfrac{\frac{3}{4m} + \frac{m^2}{16}}{\frac{2}{m^2} - \frac{9}{m^2}}$ CD: $16m^2$

$\dfrac{48m + m^4}{32 - 144}$

$\dfrac{48m + m^4}{-112}$

11) $\dfrac{\frac{x-6}{x} + \frac{x+1}{9}}{\frac{3}{x+1} - \frac{x^2}{3}}$ CD: $9x(x+1)$

$\dfrac{9(x+1)(x-6) + (x+1)(x)(x+1)}{9x(3) - (x^2)(3x)(x+1)}$

*now begin to distribute & combine like terms

$\dfrac{9(x^2-5x-6) + x(x^2+2x+1)}{27x - 3x^3(x+1)}$

$\dfrac{9x^2 - 45x - 54 + x^3 + 2x^2 + x}{27x - 3x^4 - 3x^3}$

$\dfrac{x^3 + 11x^2 - 44x - 54}{-3x^4 - 3x^3 + 27x}$

12) $\dfrac{\frac{4}{a} + \frac{a+6}{a+3}}{\frac{a^2}{a+3} - \frac{a}{16}}$ CD: $16a(a+3)$

$\dfrac{4(16)(a+3) + 16a(a+6)}{(16a)(a^2) - a(a)(a+3)}$

*now begin to distribute & combine like terms

$\dfrac{64a + 192 + 16a^2 + 96a}{16a^3 - a^3 - 3a^2}$

$\dfrac{16a^2 + 160a + 192}{15a^3 - 3a^2}$