а) $x - \frac{x}{x+1} = \frac{x}{1} - \frac{x}{x+1} = \frac{x(x+1)-x}{x+1} =$

$= \frac{x^2+x-x}{x+1} = \frac{x^2}{x+1}$

б) $\frac{m+2}{4m} - \frac{4}{m+4} = \frac{(m+2)(m+4)-4m}{4m(m+4)} =$

$= \frac{m^2+2m+4m+8-4m}{4m^2+16m} = \frac{m^2+2m+8}{4m^2+16m}$

в) $\frac{x}{x+y} + \frac{y}{x-y} = \frac{x(x-y)+y(x+y)}{(x+y)(x-y)} =$

$= \frac{x^2-xy+xy+y^2}{(x+y)(x-y)} = \frac{x^2+y^2}{(x+y)(x-y)} = \frac{x^2+y^2}{x^2-y^2}$

г) $\frac{3x+y}{x^2+xy} - \frac{x+3y}{y^2+xy} = \frac{3x+y}{x(x+y)} - \frac{x+3y}{y(y+x)}$

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

$= \frac{y^2-x^2}{xy(x+y)} = \frac{(y-x)(y+x)}{xy(x+y)} = \frac{y-x}{xy}$