Problem 1

$$cond(f) = \frac{|relative\ change\ in\ solution|}{|relative\ change\ in\ input\ data|} = \frac{[f(x+\Delta x,y+\Delta y)-f(x,y)]/f(x,y)}{[(x+\Delta x,y+\Delta y)-(x,y)]/(x,y)}$$

$$= \frac{|(x+\Delta x)-(y+\Delta y)-(x-y)|/(x-y)}{(\Delta x,\Delta y)/(x,y)} = \frac{(\Delta x-\Delta y)(|x|+|y|)}{(x-y)(|\Delta x|+|\Delta y|)}$$

$$\geq \frac{\Delta x-\Delta y}{(|\Delta x|+|\Delta y|)\varepsilon} \geq \frac{1}{\varepsilon}$$

we can conclude that subtraction is sensitive when ε is small