c) $f(x) = \frac{1}{1+x^2}$ $\qquad \frac{\int_0^1 \frac{x}{1+x^2}}{\int_0^1 \frac{1}{1+x^2}}$

$$\int_0^1 \frac{x}{1+x^2}\,dx = \begin{cases} u = 1+x^2 \\ \frac{du}{dx} = 2x \\ du = 2x\,dx \end{cases} = \frac{1}{2}\int_0^1 \frac{\overbrace{2x\,dx}^{=du}}{u} =$$

$$= \frac{1}{2}\int_0^1 \frac{1}{u}\,du = \frac{1}{2}(\ln u)_0^1 = \frac{1}{2}(\ln(1+x^2))_0^1 =$$

$$= \frac{1}{2}\left(\ln(1+1^2) - \ln(1+0^2)\right) = \frac{1}{2}(\ln 2 - \underbrace{\ln 1}_{=0}) =$$

$$= \frac{\ln 2}{2}$$

$$\int_0^1 \frac{1}{1+x^2} = \arctan x\,\Big|_0^1 = \arctan 1 - \arctan 0 =$$

$$= \arctan 1$$

$$\frac{\int_0^1 \frac{x}{1+x^2}}{\int_0^1 \frac{1}{1+x^2}} = \frac{\frac{\ln 2}{2}}{\arctan 1} = \frac{\ln 2}{2\cdot\arctan 1} = \frac{\ln 2}{2\cdot\frac{\pi}{4}} =$$

$$= \frac{\ln 2}{\frac{\pi}{2}} = \frac{2\cdot\ln 2}{\pi}$$

Svar: Masscentrum ligger vid $\frac{2\cdot\ln 2}{\pi}$.