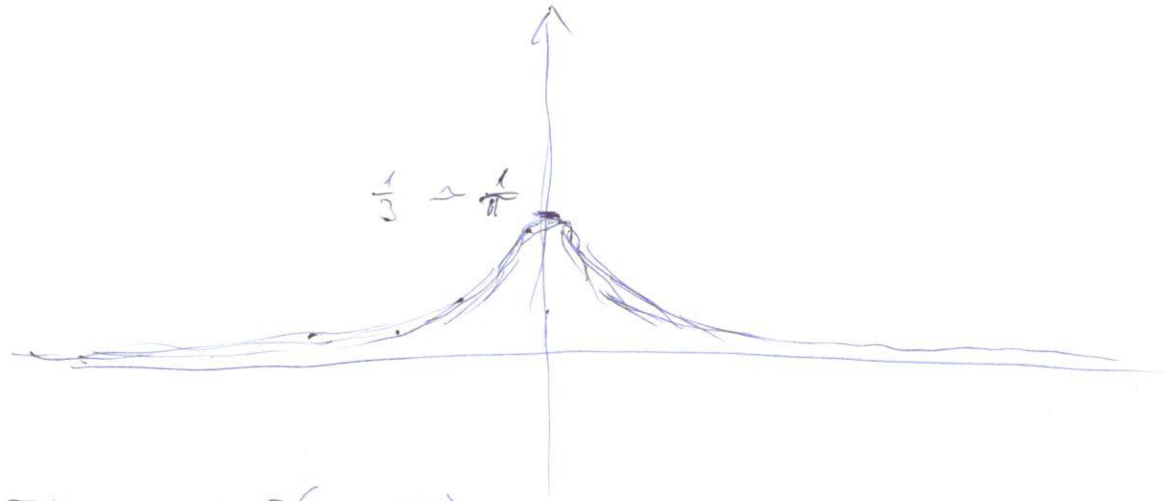
sfv-je $f(x) = F'(x)$

$$f(x) = \frac{1}{\pi} \cdot \frac{1}{1+x^2}$$



$$\mathbb{P}(X > \sqrt{3} \mid X > 1) = \frac{\mathbb{P}(X > \sqrt{3})}{\mathbb{P}(X > 1)} = \frac{1 - \mathbb{P}(X < \sqrt{3})}{1 - \mathbb{P}(X < 1)} = \frac{1 - F(\sqrt{3})}{1 - F(1)} = \frac{\frac{1}{6}}{\frac{1}{4}} = \frac{4}{6} = \frac{2}{3} \approx 67\%$$

$$\mathbb{P}(X > 1 \mid \cancel{X} 0 < X < \sqrt{3}) = \frac{\mathbb{P}(1 < X < \sqrt{3})}{\mathbb{P}(0 < X < \sqrt{3})} = \frac{F(\sqrt{3}) - F(1)}{F(\sqrt{3}) - F(0)} = \frac{\frac{1}{2} + \frac{1}{\pi} \cdot \operatorname{arctg}(\sqrt{3}) - \left(\frac{1}{2} + \frac{1}{\pi} \operatorname{arctg}(1)\right)}{\frac{1}{2} + \frac{1}{\pi} \cdot \operatorname{arctg}(\sqrt{3}) - \left(\frac{1}{2} + \frac{1}{\pi} \operatorname{arctg}(0)\right)} =$$

$$= \frac{\frac{1}{2} + \frac{1}{\pi} \cdot \frac{\pi}{3} - \frac{1}{2} - \frac{1}{\pi} \cdot \frac{\pi}{4}}{\frac{1}{2} + \frac{1}{\pi} \cdot \frac{\pi}{3} - \frac{1}{2} - \frac{1}{\pi} \cdot 0} = \frac{\frac{1}{2} + \frac{1}{3} - \frac{1}{2} - \frac{1}{4}}{\frac{1}{2} + \frac{1}{3} - \frac{1}{2}} = \frac{\frac{1}{12}}{\frac{1}{3}} = \frac{1}{4} = 25\%$$