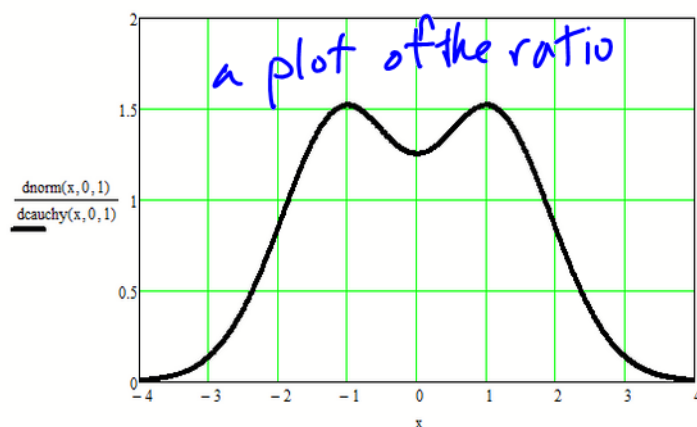
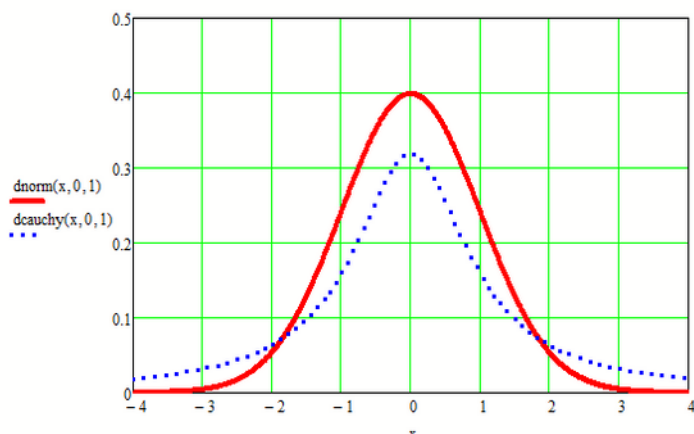


Stat 342 Example 22

Consider the potential use of the rejection algorithm to use standard Cauchy variables (i.e. ones with pdf $g(x) = \frac{1}{\pi(1+x^2)}$) to generate a standard normal variable, i.e. with pdf

$$f(x) = \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{1}{2}x^2\right)$$

Note that $\frac{f(x)}{g(x)}$ is cont^s and $\rightarrow 0$ as $x \rightarrow \pm\infty$. It is thus bounded and plotting shows that the ratio is bounded by 1.6



So one could use rejection sampling with $M=1.6$ to generate a standard normal variable.