$$\sqrt{2}\left(\frac{P(x|y=1)\,P(y=1)}{P(x)}\right) = \left(\frac{P(x|y=0)P(y=0)}{P(x)}\right)$$

$$\sqrt{2}\,P(x|y=1) = P(x|y=0)$$

$$\sqrt{2}\left(\frac{1}{\sqrt{2\pi\left(\frac{1}{2}\right)}}\exp\left(\frac{-x^2}{2(1/2)}\right)\right) = \left(\frac{1}{\sqrt{2\pi\left(\frac{1}{4}\right)}}\exp\left(\frac{-x^2}{2(1/4)}\right)\right)$$

$$\left(\sqrt{\frac{2}{\pi}}\exp\left(-2x^2\right)\right) = \sqrt{\frac{2}{\pi}}\exp\left(-8x^2\right)$$

~~$\exp(-2x^2) = 1$~~

~~$-2x^2 = \ln 2$~~

~~Decision Rule~~ ~~$\left[x = \pm\sqrt{\frac{\ln 2}{12}}\right]$~~

$$\exp(x^2) = 1$$

Decision Rule $\boxed{x = 0}$