Model: $x|\theta \sim \mathcal{N}(\theta,1600)$

Prior: $\theta \sim \mathcal{N}(800,6400)$

Prior and likelihood conjugate, so all derivations are done in closed form. In general, approximate derivations are needed.

$p(x=975) = 0.000658$

$Pr(x > 975) = 0.0252$
Model: $x|\theta \sim N(\theta,1600)$
Prior: $\theta \sim t(800,3200,4)$

$p(\theta)$
$p(x)$
$p(\theta|x=975)$

$p(x=975)=0.000449$
$Pr(x>975)=0.026$
Bayes factor = \( \frac{p(x|\text{Gaussian})}{p(x|\text{Student's t})} = 1.465 \)

- Student's t prior
  - \( p(\theta) \)
  - \( p(x) \)
  - \( p(\theta|x=975) \)

- Gaussian prior
  - \( p(\theta) \)
  - \( p(x) \)
  - \( p(\theta|x=975) \)

- \( p(x=975) = 0.000449 \)
  - \( \Pr(x>975) = 0.026 \)

- \( p(x=975) = 0.000658 \)
  - \( \Pr(x>975) = 0.0252 \)