Posterior credibility intervals
Constructing a 90% credibility interval

- A 90% interval for the posterior $p(\theta|y)$

$$p(\theta \in [\theta_1, \theta_2] \,|y) = \int_{\theta_1}^{\theta_2} p(\theta|y)\, d\theta = 0.90$$

- Constructing *central* intervals
    - 5% in left tail
    - 90% in central interval
    - 5% in right tail

- Recall the definition of the CDF

$$F(x) \equiv p(\theta < x|y) = \int_0^x p(\theta|y)d\theta$$

- We can identify θ_1 as

$$p(\theta < \theta_1|y) = F(\theta_1) = 0.05 \iff \theta_1 = F^{-1}(0.05)$$

- and θ_2 as

$$p(\theta < \theta_2|y) = F(\theta_2) = 0.95 \iff \theta_2 = F^{-1}(0.95)$$

90% central interval