

Your name: _____

Names of people you worked with: _____

Task: We want to predict the high temperature in Claremont on a randomly selected day in October. Suppose we know the variance $\sigma^2 = 12^2$. The mean, θ , is unknown. Also, let's say we'll model the temperatures using a normal distribution.

Let X = high temp on a randomly selected day in Claremont in October:

$$X \sim N(\theta, \sigma^2 = 12^2)$$

Write down the prior distribution on θ . That is, provide your best guess as to the value of θ using the normal distribution to model **your own personal** uncertainty about the parameter of interest.

1. Use notation; i.e., $\theta \sim \dots$
2. Write out the prior pdf; i.e., $\xi(\theta) = \dots$

Note: there is no right answer here. But there are some answers that seem more plausible than others.

Solution:

1. We might specify the prior distribution on θ as:

$$\begin{aligned}\theta &\sim N(\mu, \nu^2) \\ \mu &= 78^\circ, \nu^2 = (2.5^\circ)^2\end{aligned}$$

2. Which would produce the following prior pdf. Pay special attention to the fact that θ now plays the role of what used to be x in previous discussions about pdf functions.

$$\xi(\theta) = \frac{1}{2.5\sqrt{2\pi}} e^{-\frac{1}{2}(\frac{\theta-78}{2.5})^2}$$