Homework 4

Problem 1

Use the standard normal table to answer the following.

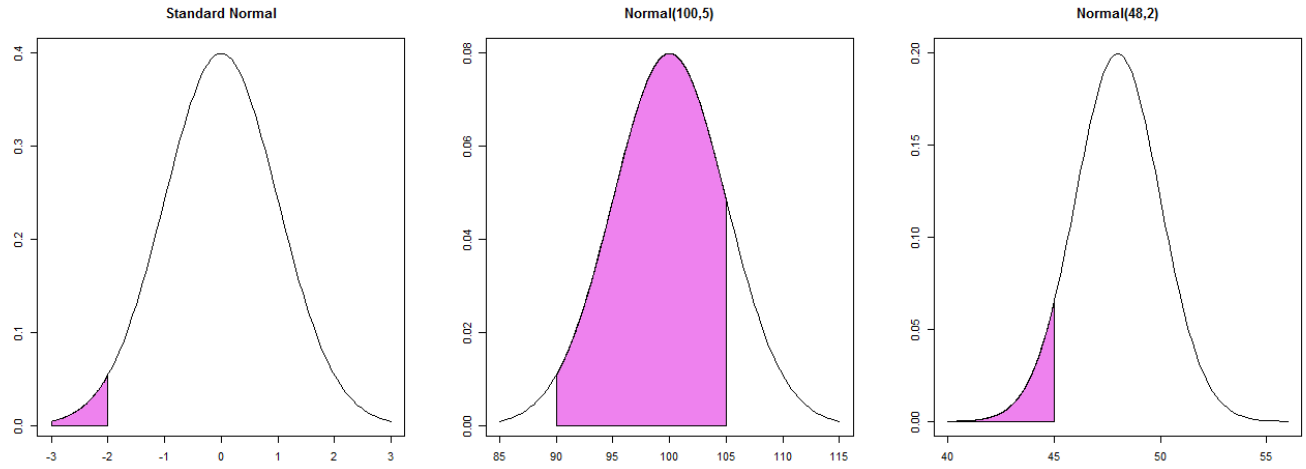
(a) Suppose $X \sim N(8, 3)$. Find $P(1 < X < 5)$.

(b) Suppose $X \sim N(8, 0.3)$. Find $P(X \geq 7.6)$.

(c) Suppose $X \sim N(0, 0.7)$. Find $P(-2 < X < -1.3)$.

Problem 2

Use the standard normal table to compute the shaded areas.



Problem 3

The random variable Z is distributed Normal(0,1). In each case find z^* that satisfies the condition.

(a) $P(Z \leq z^*) = 0.635$

(b) $P(Z > z^*) = 0.02$

(c) $P(-z^* \leq Z \leq z^*) = 0.837$

Problem 4

The diameters of Douglas firs grown at a Christmas tree farm are normally distributed with a mean of 4 inches and a standard deviation of 1.5 inches.

(a) What proportion of the trees will have diameters between 3 and 5 inches?

(b) What proportion of the trees will have diameters less than 3 inches?

(c) Your Christmas tree stand expands to a diameter of 6 inches. What proportion of the trees will not fit in your stand?

Problem 5
A normal random variable X has unknown mean μ and standard deviation $\sigma = 2$. If the probability that X exceeds 7.5 is 0.8023, find μ.

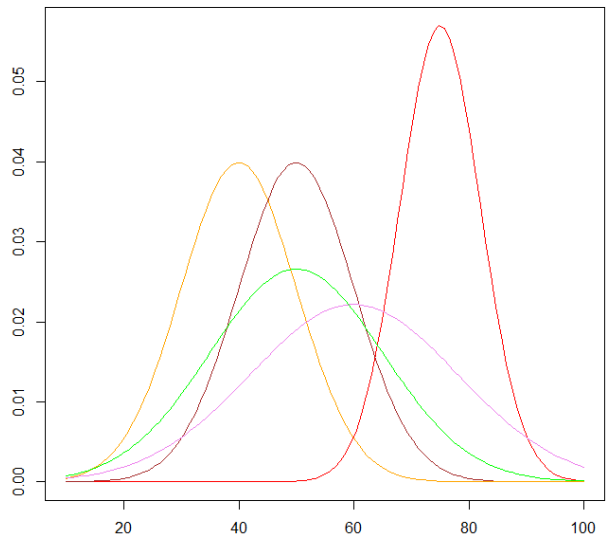
Problem 6
A normal random variable X has mean $\mu = 1$ and unknown standard deviation σ. If $P(X < 0) = 0.4$, find σ.

Problem 7
Assume that heights of women in a population follow a normal distribution with mean $\mu = 64.3$ inches and standard deviation $\sigma = 2.6$ inches.

(a) A woman is chosen at random from this population. What is the probability that she is more than 67 inches tall?

(b) Five women are chosen at random from this population. What is the probability that *exactly* one of them is more than 67 inches tall?

Problem 8
Identify the curve of each distribution:
Normal(40,10), Normal(50,10), Normal(50,15), Normal(60,18), Normal(75,7)



Textbook Problems

Lecture 10: 4.70, 4.72, 4.76
Lecture 11: 4.68, 4.74, 4.75, 4.78, 4.82, 4.84, 4.90