Ch6-7 Homework

Note: To get full credit, student must sketch a normal curve for each question and shade the corresponding area/probability.

1. Men heights are normally distributed with mean 69.5 in. and standard deviation 2.4 in. Women heights are normally distributed with mean 63.8 in. and standard deviation 2.6 in. To enter the model industry, a person must have height between 70 in. and 80 in.
a) Find the percent of women meeting the height requirement.
b) Find the percent of men meeting the height requirement.

2. The lengths of pregnancies are normally distributed with a mean of 268 days and a standard deviation of 15 days.
a) A wife claimed to have given birth 308 days after a brief visit from her husband, who was serving in the Navy. Given this information, find the probability of a pregnancy lasting 308 days or longer. What does the result suggest?
b) Premature babies (if the length of pregnancy is in the bottom 3%) often require special care, and this result could be helpful to hospital administrators in planning for that care. Find the length that separates premature babies from those who are not premature.

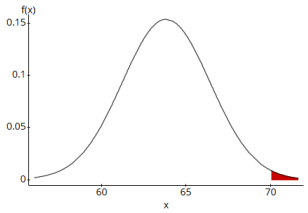
3. The time students take to finish a 1-hr statistic exam is normally distributed with mean of 45 minutes and standard deviation of 5 minutes.
a) What is the finishing time of the lower 30%?
b) What is the finishing time of the upper 10%?
c) Find P_{70} and interpret its meaning.

4. In the United States, someone is sexually assaulted every two minutes, on average, according to a number of studies. Suppose the standard deviation is 0.5 minutes and the sample size is 100. Find the probability that a sexual assault occurs on the average between 1.75 and 1.85 minutes.

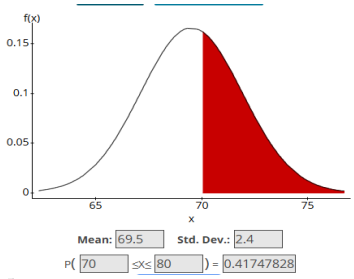
5. The distribution of weights for newborn babies in a hospital is approximately normally distributed with a mean of 7.5 pounds and a standard deviation of 0.7 pounds.
a) In a group of 9 babies, what is the probability that their mean weight is less than 8 pounds?
b) In a group of 16 babies, what is the probability that their mean weight is less than 8 pounds?
c) Explain why the answer in part (b) is bigger than the answer in part (a).

6. Men are typically heavier than women and children, so when designing an elevator, assume a worst-case-scenario in which all people inside are men. The weights of men are normally distributed with a mean of 182.9 lb and a standard deviation of 40.8 lb. Given that the elevator has a limit of 3,200 lb, is it safe to have 16 people in the elevator? Explain.

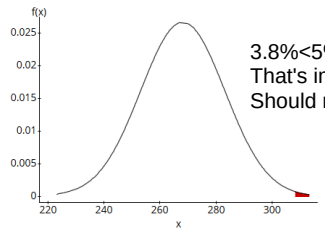
1a



1b

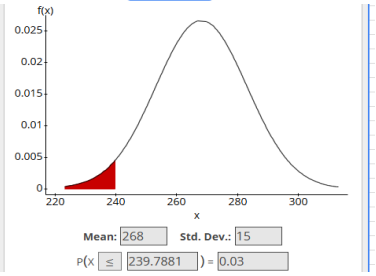


2a

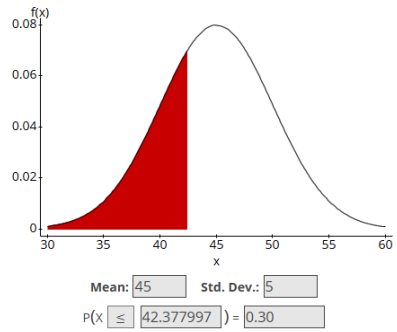


3.8%<5%
That's impossible
Should not do that

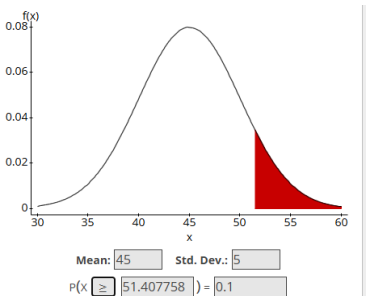
2b



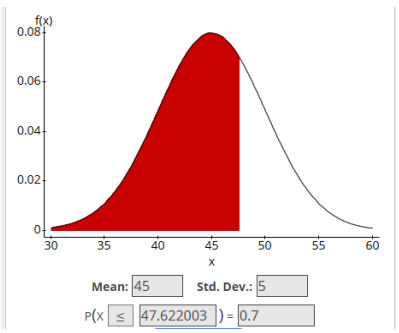
3a



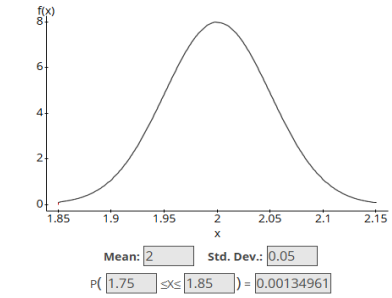
3b



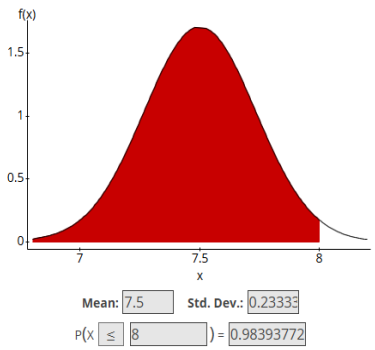
3c That's mean 70% student finish exam in 47.6min or less



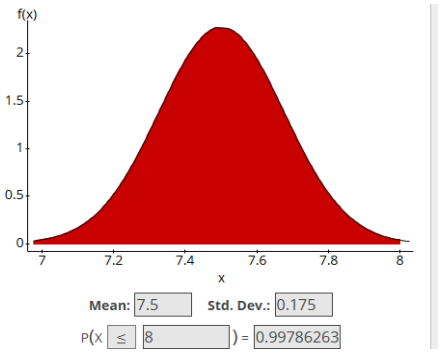
4 mean sigma=0.5/(100)*0.5=0.05



5a mean sigma=0.7/(9)*0.5=0.2333

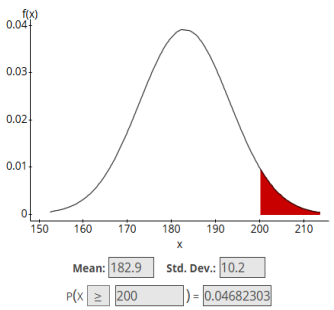


5b mean sigma=0.7/(16)*0.5=0.175



5c Cuz it's larger sample and standard deviation is smaller mean of X becomes more tightly concentrated around 7.5

6c limit mean=3200/16=200 P(meanx>200
mean sigma=40.8/(16)*0.5=10.2



4.68%<5% it's likely to be safe but still not fully safe