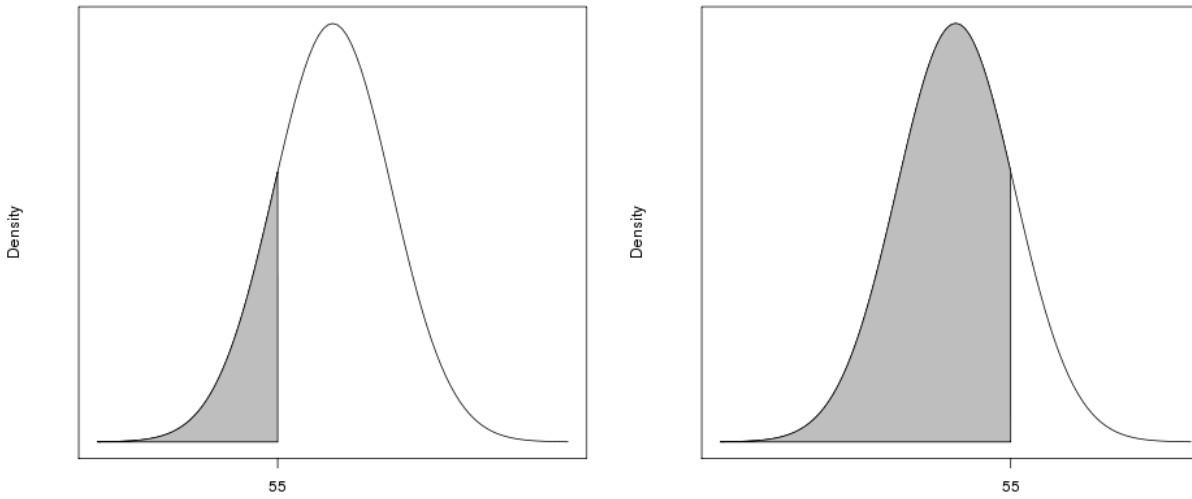
ECON 325 HW 6 additional Q1

1. A random sample of `n` junior managers working for corporations in a large city centre was taken in order to estimate the average daily commuting times for all such managers. Suppose that the population times for all such managers has mean `m` minutes and standard deviation `s` minutes. Answer the following questions, rounding your answers to two decimal places where appropriate.

   (a) Find the standard error of the sample mean commuting time.

   (b) Consider that the sampling distribution of the sample mean follows the normal distribution. The probability that the sample mean is less than `x` minutes is shown as the shaded area in which of the following graphs?



   (c) Find the probability that the sample mean is less than `x` minutes.

   (d) When the sample size is increased, the standard error of the sample mean will:

      i. increase,

      ii. decrease, or

iii. stay the same.

(e) When the sample size is increased, the probability that the sample mean is less than `x` minutes will:

i. increase,

ii. decrease, or

iii. stay the same.

The following information is not visible to students.

Randomisation:

```
n <- sample(12:20, 1)
m <- sample(45:70, 1)
s <- sample(12:18, 1)
x <- m+4
```

Attempts: Suggest three attempts should be permitted.
Solution: Available in WeBWorK.
Tagging: Inference; sampling distribution of sample mean, normal distribution; find the standard error of a sample mean, identify which density function graphic indicates a lower tail probability for the sample mean, find the probability that the sample mean is less than a given value, decide whether the standard error would increase or decrease by increasing the sample size, decide if a tail probability for the sample mean would increase or decrease by changing the sample size.
DBsubject('Statistics')
DBchapter('Sampling distributions')
DBsection('Sample mean')
Level('3')
Below is a screenshot showing how the question appears in WeB-

WorK's library browser: