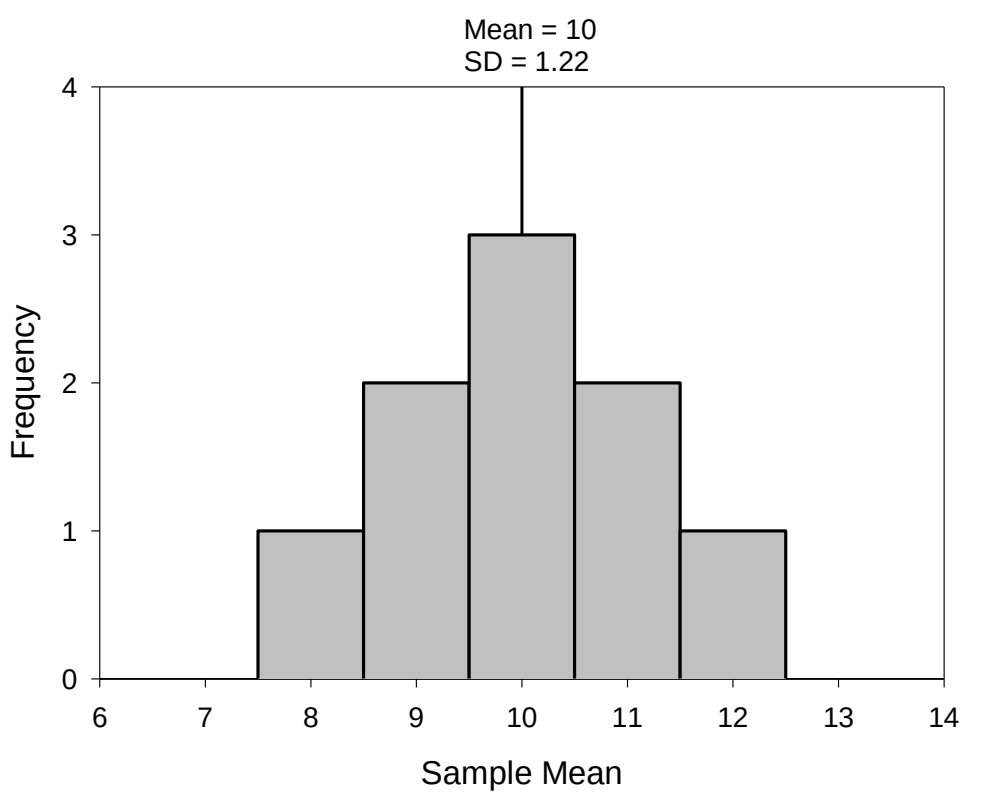
Outline for Ch. 6

1. Review of key facts
2. Sampling distribution of sample means
3. Central Limit Theorem
   - Standard error
4. **Determining the probability of drawing a sample with particular characteristics, from a particular population (*return of the z-score!*)**

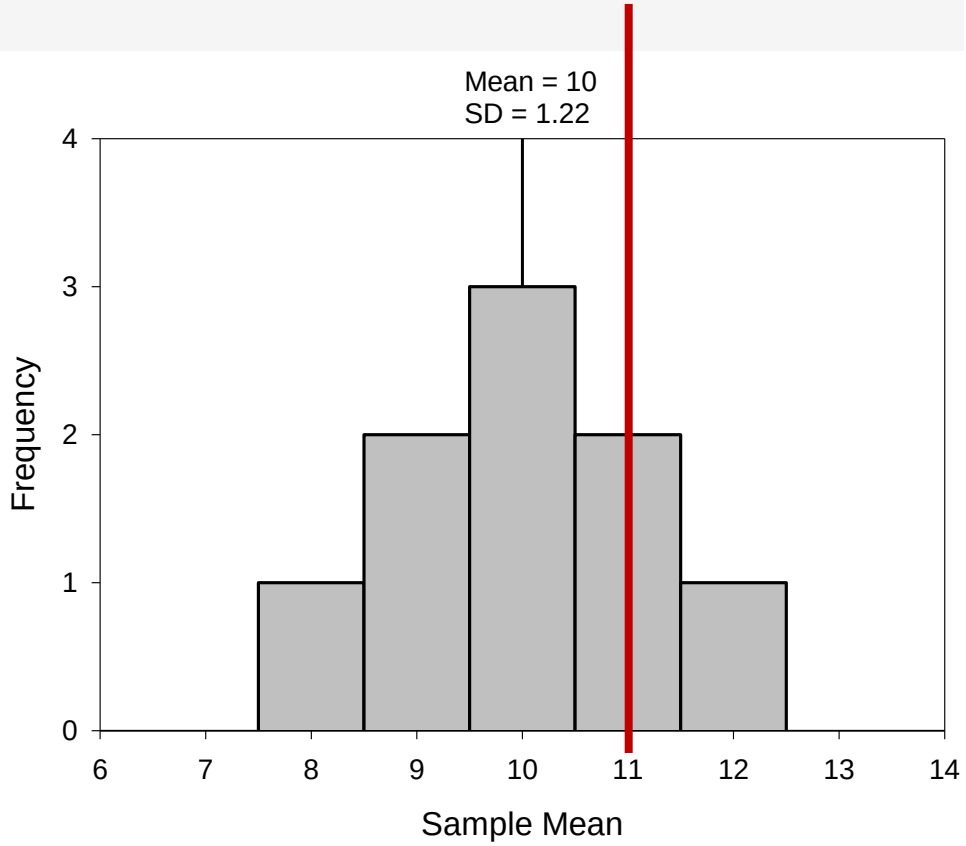
Determining the probability of drawing a sample w/particular characteristics (e.g., with a particular mean) from a particular population

Assuming our population of BSC professors' happiness scores has a mean of μ = 10, what's the probability of randomly selecting a *sample* of BSC professors **whose mean happiness is ____ or greater**? *or* **whose mean happiness is less than ____** ?



Determining the probability of drawing a sample w/particular characteristics from a particular population

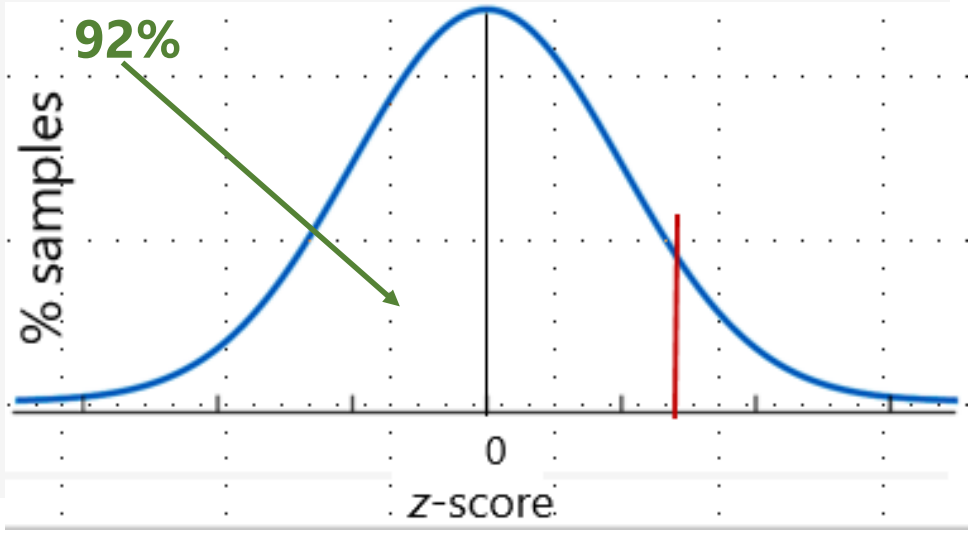
Assuming our population of BSC professors' happiness scores has a mean of μ = 10, what's the probability of randomly selecting a sample of BSC professors whose mean happiness is **11** or greater?



Determining the probability of drawing a sample w/particular characteristics from a particular population

Assuming our population of BSC professors' happiness scores has a mean of μ = 10, what's the probability of randomly selecting a sample of BSC professors whose mean happiness is **11** or greater?

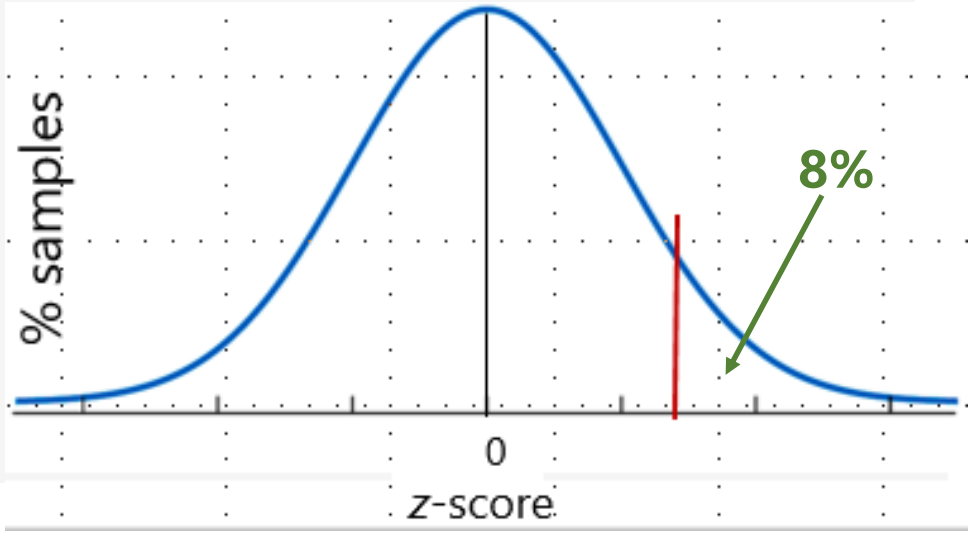
1. Convert sample mean of 11 (raw score) into a z-score using a formula (that we won't get into here).
2. Look up that z-score in z-table to get the probability of sample means that are *less* than 11 (E.g., < 11 = 92% of sample means)



Determining the probability of drawing a sample w/particular characteristics from a particular population

Assuming our population of BSC professors' happiness scores has a mean of μ = 10, what's the probability of randomly selecting a sample of BSC professors whose mean happiness is **11** or greater?

1. Convert sample mean of 11 (raw score) into a z-score using a formula (that we won't get into here.)
2. Look up that z-score in z-table to get the probability of sample means that are less than 11 (E.g., < 11 = 92% of means)
3. Subtract that probability from 1.0 to get probability of sample means that are 11 or greater.
   - E.g., 11 or greater = 8% of sample means

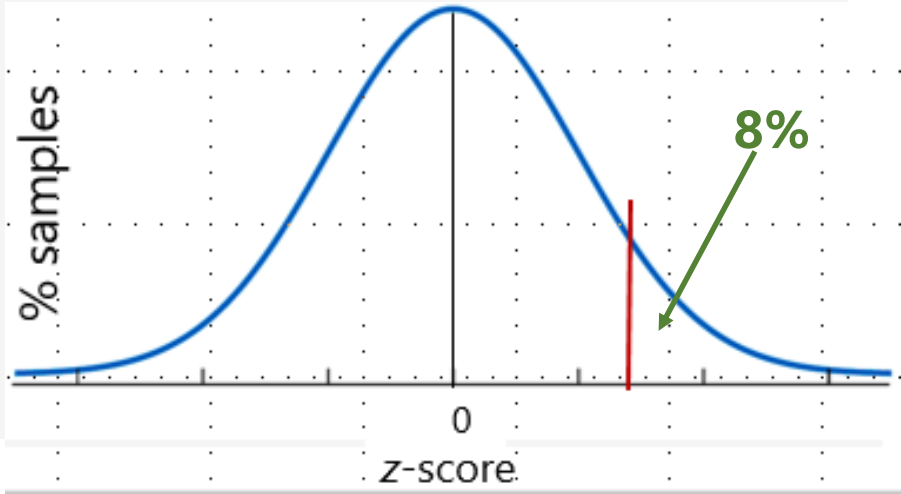


Determining the probability of drawing a sample w/particular characteristics from a particular population

Assuming our population of BSC professors' happiness scores has a mean of μ = 10, what's the probability of randomly selecting a sample w/a mean of **11** or greater (and w/a mean less than **11**)?

1. Convert sample mean of 11 (raw score) into a z-score using a formula (that we won't get into here.)
2. Look up z-score in z-table to get probability of sample means that are less than 11 (e.g., < 11 = 92% of means)
3. Subtract that probability from 1.0 to get **probability** of sample means that are 11 or greater.
   - E.g., 11 or greater = 8% of samples means
   - The **p-value** associated with drawing a sample with a mean at least as high as 11 is .08

   $p = .08$



Take-home points from Chapter 6

- If we draw several large random samples from a population, these samples' means (x-bars) will be at least slightly different from each other and at least slightly different from the population mean (μ).
- Supposing we draw one sample
  - we can calculate the sample's *standard error (SE)*, which tells us how closely clustered around vs. how widely dispersed from the population mean, a typical sample's mean is.
  - we can calculate the sample's *mean (x-bar)*, and then calculate the ***probability*** that we would draw a sample with that mean or greater (or with that mean or lower), from the population.
    - this probability is also called the **p-value**

These concepts are challenging,
but you can practice them with the self-graded HW for Ch. 6.

Work For Tomorrow

- Make sure to have completed readings related to Ch. 6, 7, and portions of Ch. 8 (see syllabus for relevant sections)
- Study for, and complete, quiz.

- Finish draft of exam corrections assignment so you can attend office hours Wed 3:30 – 4:30 pm or Thurs 8 – 9:30 am to ask last-minute questions.
  - Assignment due class time Thursday