MAT 223, Discussion Questions 10.23

1. What are some properties of a normal distribution?

Symmetric
follows empirical rule
defined in terms of mean & standard deviation

2. Give three examples of variables that are normally distributed.

measurement errors, heights, IQs

Answers will vary

3. What special properties does the standard normal distribution have (as compared with a general normal distribution)?

Centered at zero
Standard deviation is 1

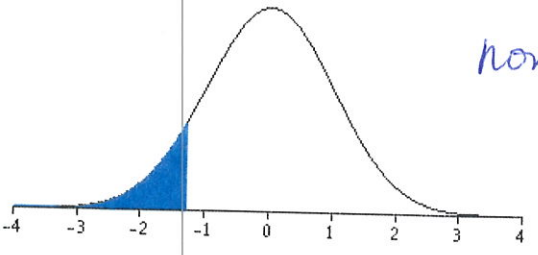
4. How are z-scores related to the standard normal distribution?

the z-score is the # of standard deviations from the mean.

5. How do we use the standard normal distribution to calculate probabilities?

we calculate the area under the curve bounded by the z-score. we can use the table in the book or use the calculator to do this

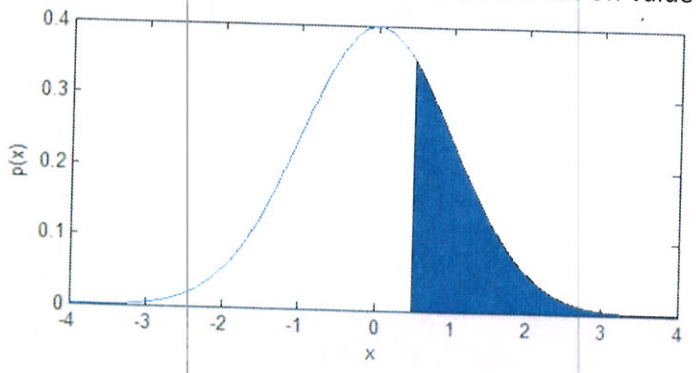
6. Find the shaded area under the curve if the mean is 0 and the standard deviation is 1. The cut-off score here is $z = -1.28$.



normalcdf(-E99, -1.28) = .10027...

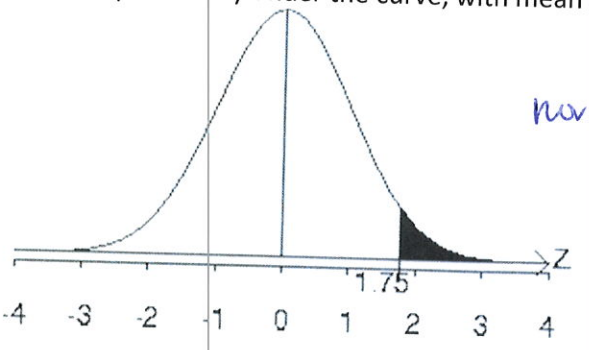
10%

7. Find the shaded area under the curve for the cut-off value $z = 0.5$.



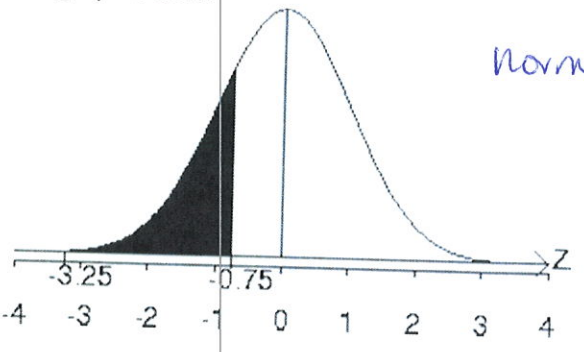
normalcdf(.5, E99)
= .3085...
30.9%

8. Find the probability under the curve, with mean 0 and standard deviation of 1.



normalcdf(1.75, E99) = .0400...
4%

9. Estimate the probability (area) under the normal distribution curve for the z-scores shown on the graph below.



normalcdf(-3.25, -.75) =
= .2260...
22.6%

10. What do you think about this article at https://www.sciencenews.org/article/math-civil-right? Particularly in light of this study
http://www.princeton.edu/main/news/archive/S37/75/69M50/index.xml?section=topstories