MAT 135, Discussion Questions 3.25

1. What kind of events could be modeled by a uniform distribution?

random #'s ; outcomes on dice
answers will vary

2. What are some properties of a normal distribution?

Symmetric
follows Empirical Rule
determined by mean & standard deviation

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

heights
averages of any kind
errors, IQs

answers will vary

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

mean is zero
standard deviation is one

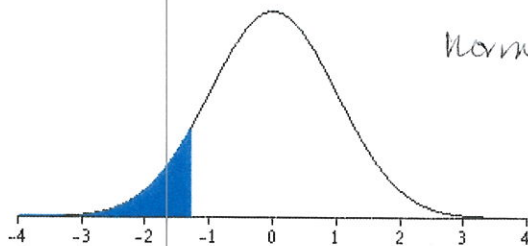5. How are z-scores related to the standard normal distribution?

Z-scores are the # of standard deviations a score is from the
mean in a normal distribution

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

z-scores are associated w/ a percentile (% below)
and this is related to a probability

(more formally, the probability is a portion of the area
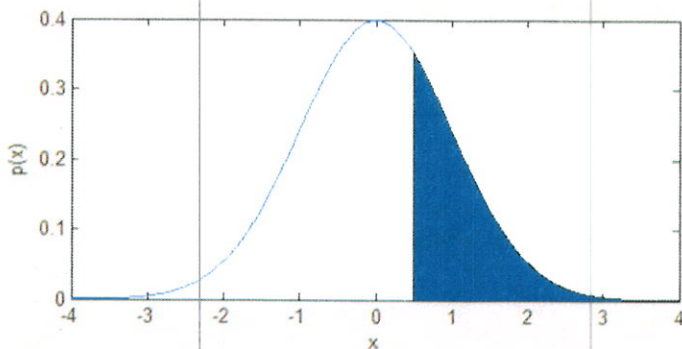under the curve bounded by z-scores)

7. Find the shaded area under the curve if the mean is 0 and the standard deviation is 1. The cut-off score here is $z = -1.28$.
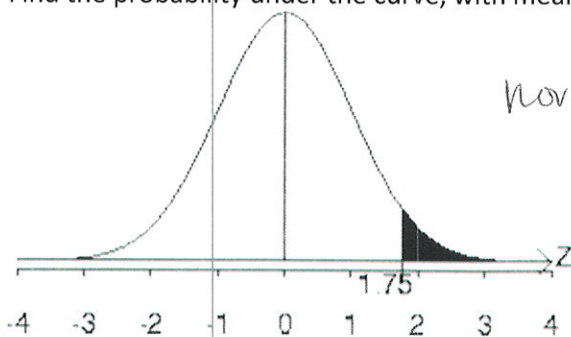
normalcdf $(-E99, -1.28) = .1002726...$

around 10%

8. Find the shaded area under the curve for the cut-off value $z = 0.5$.
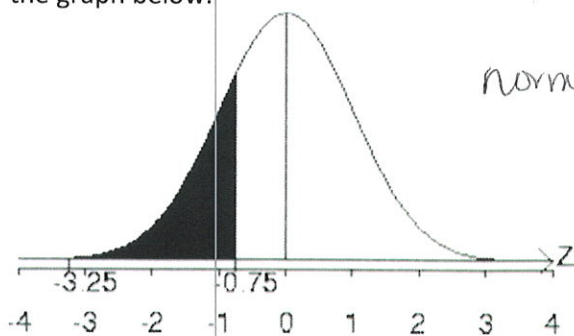
normalcdf $(.5, E99)$
$= .305375...$

around 30.5%

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

normalcdf $(1.75, E99) = .040059...$

around 4%

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

normalcdf $(-3.25, -.75) =$
$.22605$

or around 22.6%