Math 3307 Test 2 Chapter 7

Name:

5 point penalty for no name.

Please use dark blue or black ink. If I can’t read it, the charge is 3 points.

Use this form to turn in your answers. If you don’t, copy the point values on each problem. If they aren’t there, the charge is 3 points.

**Problem 1 18 points: 6, 6, 6**

A. Sketch a standard normal distribution. Show where  1, 2, and  3 standard deviations from the mean are; what percent of the area is inbetween each pair?

B. What percent of the data points is 2 standard deviations above the mean in THEORY?

C. Discuss the difference between a z-score of  − .13 and a z-score of 2.13

What do you know about each?

**Problem 2 12 points**

What is it about z-score that matters? Why can we use it to find probabilities in the chart? What is the formula for a z-score? Tell me everything!

**Problem 3 20 points**

The Semicircle Distribution is pictured below.

Some facts you’ll need to know are that





A Ms. Leigh says the distance from *D* to *E,* the radius, is π.

Is she right? Why or why not?

Note the area of a circle is  and *DE* is the radius of the semicircle.

Continued:

B Show your work carefully:

B1 

B2 

**Problem 4 12 points**

The university administration assures Ms. Leigh that she has only one chance in 100 of being trapped in Elevator A in PGH. If she goes up in this elevator 5 days a week for 15 weeks of a semester, for 10 semesters, what is the probability that she’ll never be trapped on the way up first thing in the morning?

This is a binomial experiment.

A Discuss why it is binomial

B. Identify with a definition and a value

n

p

q

x

The formula is P(X) =  Fill in the formula with the above numbers and stop.

**Problem 5 15 points**

Suppose an opaque cup holds 8 pennies and two nickels. Your experiment is to pull one coin from the cup and record the outcome, then toss it back in and pull a second. Record this as an ordered pair (first, second). Create a theoretical tree diagram for this experiment. The random variable X is the number of pennies pulled each pair of draws. Create a distribution table for this experiment and discuss in writing how you know it’s a distribution. Find the sampling mean and standard deviation showing the formulas you used.

**Problem 6 8 points**

Given a normal distribution with a mean of 17 and standard deviation of 2, what percent of the data lies between 13 and 21? Sketch this as part of showing your work.

**Problem 7 8 points**

A distribution is normal with a mean of 50 and a standard deviation of 3.

The following z-scores hold for percentiles:

1.65 90%

1.96 95%

2.58 99%

Find the x value associated with the 99% percentile.

Show your work in agonizing detail.

**Extra Credit 8 points**

A reviewer listens to 70 songs on KIKK radio. He notices that the songs sung by the country western stars seem to have one or more of three themes: great dogs, cold beer, and unfaithful women.

In fact, 6 songs feature all three themes.

35 songs are about dogs

29 songs are about beer

9 songs are about dogs and women

11 songs are about beer and women

13 songs are about dogs and beer

11 songs are about beer only

19 songs are about dogs only

14 songs are about women only

How many songs have women as a theme? How many songs are about something other these themes (these were songs about trucks!). Put your diagram on the next page, please.