

Exam 2/Chapters 5 – 6

1) Answer true or false to each of the following:

- (a) ___ The expected value of a probability distribution is the same as the mean of the distribution
- (b) ___ $P(z > 2.35) = 0.9906$
- (c) ___ All binomial distributions are probability distributions.
- (d) ___ As the sample size goes up the standard deviation of the sample means, σ_x , also goes up.
- (e) ___ Statistics has many, many real life applications.

2) The number of courses taken by college students along with the probabilities of each are displayed in the probability distribution below. Find the mean, μ , and standard deviation, σ , for the number of courses taken.

Number of courses	Probability
1	0.1
2	0.15
3	0.25
4	0.35
5	0.12
6	0.03

3) In a Gallup Poll conducted September 14 – 16, 2007, 47% of Democrats support Hillary Clinton for the presidential nomination. We will assume this is a population value, that is, 47% of Democrats currently support Hillary Clinton and 53% of Democrats support someone other than Hillary Clinton.

If 500 democrats are randomly selected then:

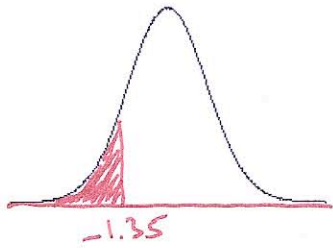
- (a) what is the probability that exactly 240 of them would plan to support Hillary Clinton?
- (b) what is the probability that more than 250 of them would plan to support Hillary Clinton?
- (c) what is the probability that between 230 and 260, inclusive, of them would plan to support Hillary Clinton?
- (d) what is the probability that less than 200 would plan to support Hillary Clinton?
- (e) if we were to take a sample of 500 democrats one month after the previous survey and found less than 200 people supported Hillary Clinton then what would you think? Why?
- (f) what is the expected number of people out of 500 who would plan to support Hillary Clinton?
- (g) what is the standard deviation of expected number of people out of 500 who would plan to support Hillary Clinton?

4) According to the book *Diagnostic Tests with Nursing Applications*, the white blood cell count per cubic millimeter of whole blood for a healthy adult is approximately normal with a mean of $\mu = 7500$ and a standard deviation of $\sigma = 1750$. Low white blood cell counts may indicate a viral infection.

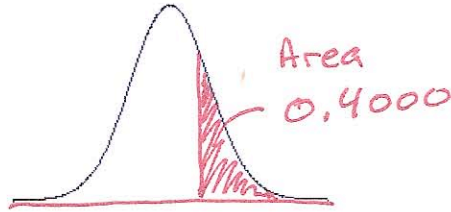
- (a) What is the probability that a healthy adult has a white blood cell count per cubic millimeter of whole blood is between 5500 and 9500?
- (b) What is the value of P_{75} , the value that separates the lowest 75% from the highest 25%?
- (c) What is the probability that on a single test, the patient has a white blood cell count less than 6000?
- (d) Should the patient be concerned with a test result less than 6000? Why?
- (e) What is the probability that on 6 tests, the patient averages a white blood cell count less than 6000?
- (f) Should the patient be concerned with an average on 6 tests that is less than 6000? Why?

5) For the standard normal distributions below evaluate:

(a) the area shown.

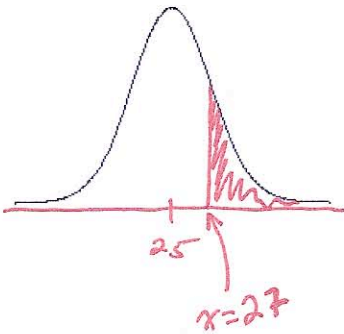


(b) the z-number that will produce the area shown.



6) For the normal distribution below with $\mu = 25$ and $\sigma = 5$ evaluate:

(a) the area shown



(b) the x-number for the area shown

