Elementary Statistics
TEST 2
Fall 2010
Name:…….
10+2+2+5+2+2+10+9+10+12+10+8+11+4+3=100

1 Let $S=\{1,\ 2,\ 3,\ 4,\ 5,\ 6\}$, $A=\{2, 3, 5\}$, and $B=\{4,\ 5\}$. Find the following sets.

(a) $A\cap B$

(b) $A\cup B$

(c) $A\cap B'$

(d) $A'\cap B'$

(e) $A\cup B'$

2 If $P(A) = 0.05$ then find $P(A')$.

3 What is the value of $P(\phi)$?

4 If $A\cap B=\phi$, $P(A)=0.27$, and $P(B)=0.35$, then find $P(A\cup B)$.

5 What are the odds for the occurrence if its probability is 0.35?

6 Convert 13 to 7 odds to probability.

7 If $P(A) = 0.47$, $P(B) = 0.37$, and $P(A \cap B) = 0.27$, then find the following:

(a) $P(A \cup B)$

(b) $P(A' \cup B')$

(c) $P(A \cap B')$

(d) $P(A' \cap B')$

(e) $P(A \cup B')$

8 The data below, in thousands, represent the age of persons receiving Medicaid and their poverty level. (Source: U.S. Census Bureau)

	Under 18 years (A)	18 years and over (A')
Below Poverty Level (B)	8,550	6,834
Above Poverty Level (B')	5,884	7,440

(a) Among those receive Midicaid, what percent is below the poverty level?
Or find $P(B)$.

(b) Among those receive Midicaid, what percent is above the poverty level and under 18 years of age?
Or find $P(A \cap B')$.

(c) Among those receive Midicaid, if a randomly selected person is under 18 years of age, what is the probability that he or she is below poverty level?
That is find $P(B \mid A)$.

9 Let X have a Binomial distribution with $n = 6$ and $p = 0.7$. Find the following:

(a) $P(X = 2)$ = Probability of X is equal to 2

(b) $P(X < 2)$ = Probability of X is less than 2

(c) $P(X \leq 2)$ = Probability of X is at most 2

(d) $P(X > 2)$ = Probability of X is more than 2

(e) $P(X \geq 2)$ = Probability of X is at least 2

10 Consider the following distribution.

X	1	2	3
$P(X)$	0.3	0.3	0.4

Find

(a) Mean

(b) Variance

(c) Standard deviation

11 Find the following probabilities using the standard normal distribution. **Also draw a normal probability graph for each part and shade the area of interest.**

(a) $P(Z \le 0)$.

(b) $P(Z \le 1.58)$.

(c) $P(Z \le -1.08)$.

(d) $P(-1.58 \le Z \le -1.08)$.

(e) $P(-1.58 \le Z \le 1.08)$.

12 If z_α denotes the value of Z for which the area under the standard normal curve to its right is equal to α, find

(a) $z_{0.0668}$;

(b) $z_{0.05}$;

Also draw a normal probability graph for each part and shade the area of interest and mark the point of interest.

13 Let the random variable X have a normal distribution with the mean 50 and the standard deviation 5. Find the following:
Draw graphs for parts (d) and (e).

(a) Z score when $X = 57$.

(b) Z score when $X = 40$.

(c) Z score when $X = 52$.

(d) $P(52 \le X \le 57)$.

(e) $P(40 \le X \le 57)$.

14 What are the four basic rules of probability?

15 Find the third quartile of the standard normal distribution.