

Sample Midterm- Psych 465  
(Sample—Key is at the end)

Dr. Marelich (revised 3-4-04)

Directions: Welcome to the midterm. Please use the space provided below each item to complete any calculations...if you need more space, use the back of the page. You have 1 hour and 15 minutes to complete the exam. Make sure you interpret your results where needed!

1. The sales manager of a small computer company has just hired some new sales representatives for the firm's line of laptop computers. From experience, the manager knows that an average sales representative will make one sale for every five customers approached (i.e., null hypothesis). Assume that each customer is independent of the others.

If a new employee approaches five customers and sells a computer to four of them, is this new employee selling significantly better than the average? Interpret results.

2. Research rats may be purchased from five suppliers. In how many ways can three suppliers be chosen from the five? Interpret your results.

3. Twenty students are competing in a poster presentation for three prizes (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>). How many possible orders are there for the three prizes? Interpret your results.

4. A daycare center has 10 different toys for the children to play with while being babysat. What is the maximum number of children that can be babysat at one time if the daycare center wants each child to be able to play with two toys at a time? (order is not important)





**Key:**

1. It's a BINOMIAL.  $N = 5$   $r = 4$   $p = .20$ ,  $q = .80$   
You have to first calc  $4/5 = .0064$   
Then you have to calc  $5/5 = .00032$   
Then you add them up  $.0064 + .00032 = .0067$ , which is less than .05, so sig.
2. It's a combination.  
$$\frac{5!}{3!2!} = 10 \text{ combinations}$$
3. It's a permutation. (order is important)  
$$\frac{20!}{(20! - 3!)} = 6,840 \text{ possible orders}$$
4. It's a combination.  
$$\frac{10!}{2!8!} = 45 \text{ children may be babysat while they can all play with two toys each}$$
5. It's a binomial.  $N = 10$   $r = 8$   $p = .50$ ,  $q = .50$   
You have to first calc  $8/10 = .0439$   
Then you have to calc  $9/10 = .0098$   
Also you calc  $10/10 = .001$   
Then you add them up  $.0439 + .0098 + .001 = .0547$ , which is less than .10, so sig.
6. It's a goodness-of-fit chi square test.  
 $\chi^2 = 6,230.77$ , sig at .05 level,  $df = 3$ ,  $CV = 7.82$ , therefore claim appears to be true
7. It's a test of independence chi square.  
 $\chi^2 = 44.13$ , sig at .05 level,  $df = 1$ ,  $CV = 3.84$ . There is an association between gender and seriousness of crime.
  - Odds ratio: 3. Males are 3 times more likely to have committed a serious crime.
8. It's a test of independence chi square.  
 $\chi^2 = .1261$ , not sig at .05 level,  $df = 1$ ,  $CV = 3.84$ . There is no relation between sexual codes of primitive tribes and their behavior towards neighboring tribes.