AP STATS

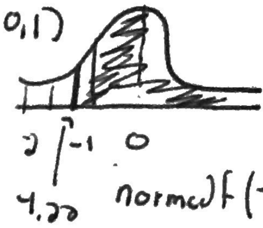
More Midterm Practice Questions

Name Key

Date ______ Hour ______

1) Using the standard normal distribution tables, what is the area under the standard normal curve corresponding to $Z > -1.22$?

N(0,1)



A) 0.1151 B) 0.1112 C) 0.8849 D) 0.8888

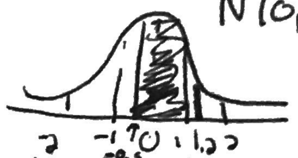
normalcdf(-1.22, 10,000) ≈ .8888

2) Using the standard normal distribution tables, what is the area under the standard normal curve corresponding to $-0.5 < Z < 1.2$?

A) 0.3085 B) 0.8849 C) 0.5764 D) 0.2815

N(0,1)

normcdf(-.5, 1.2) ≈ .5764



3) I wish to determine the correlation between the height (in inches) and scoring average (points per game) of women on a college basketball team. To do this, I measure the height and scoring average of two players on the team. The measured values are

	Player #1	Player#2
Height	70	75
Scoring Avg.	11.0	20.0

L_1	L_2
70	11.0
75	20.0

Stat → Calc #8

r = 1

Referring to the information above, the correlation r computed from the measurements on these males is

A) equal to 1.
B) positive and between 0.25 and 0.75.
C) near 0, but could be either positive or negative.
D) exactly 0.
E) Meaningless, since the slope is greater than 1.

4) The number of calories in a one-ounce serving of a certain breakfast cereal is a random variable with a mean 90 and standard deviation 2. The number of calories in a full cup of whole milk is a random variable with mean 150 and standard deviation 3.5. For breakfast you eat one ounce of cereal with ½ cup of whole milk. Let Z be the random variable that represents the total number of calories in this breakfast. The mean of Z is

A) 150
B) 165
C) 195
D) 240
E) 120

Z: total # of calories

X: calories 1oz serving cereal $\mu = 90$ $\sigma = 2$

Y: calories full cup whole milk $\mu = 150$ σ 3.5

$\mu_Z = X + \frac{1}{2}Y$

$Z = 90 + \frac{1}{2}(150) = 90 + 75 = 165$

5) Refer to the previous problem, question # 4. What is the standard deviation?

A) 5.5

B) 16.25

C) 4.03

D) 7.06

E) 2.66

$$\sigma_Z = \sqrt{(2)^2 + \left(\frac{3.5}{2}\right)^2}$$

$$\sigma_Z = \sqrt{(2)^2 + (1.75)^2}$$

$$\sigma_Z = \sqrt{7.0625}$$

$$\sigma_Z \approx 2.66$$

6) A college basketball player makes 70% of his free throws. Suppose the probability is the same for each free throw he attempts, and free throw attempts are independent. What is the probability that it takes more than 4 free throws before he makes his first free throw?

geometric

B ✓

I ✓

T ✓

S ✓

$$P(X > 4) = 1 - P(X \le 4) \approx 1 - \text{geomcdf}(.70, 4) \approx .0081$$

1, 2, 3, 4, 5, 6, ...

where $p = .70$ and $x = 4$

X: # of attempts until 1st free throw made

$p = .70$

7) A college basketball player makes 70% of his free throws. Over the course of the season he will attempt 100 free throws. Assuming free throw attempts are independent, what is the probability that the number of free throws he makes exceeds 60?

binomial

B ✓

I ✓

N ✓ $n = 100$

S ✓

$p = .70$

$n = 100$

X = # of free throws made

$$P(X > 60) = 1 - P(X \le 60)$$

0, 1, 2, ... 59, 60, 61, 62, ... 100

$= 1 - \text{binomcdf}(100, .70, 60)$

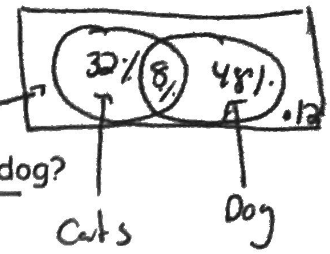
where $n = 100$, $p = .70$, and $x = 60$

$\approx .979$

8) In order to determine if smoking causes cancer, researchers surveyed a large sample of adults. For each adult they recorded whether the person had smoked regularly at any period in their life and whether the person had cancer. They then compared the proportion of cancer cases in those who had smoked regularly at some time in their lives with the proportion of cases in those who had never smoked regularly at any point in their lives. The researchers found a higher proportion of cancer cases among those who had smoked regularly than among those who had never smoked regularly. What type of study is this? Observational Study

9) In a certain neighborhood 40% of the households own cat, 56% own dog, and 8% own both a cat and a dog.

Neither cat nor dog



a) What is the proportion of households that own a cat but not a dog?

32%

b) What is the proportion of households that own neither a cat nor dog?

12%

10) For which of the following counts would a binomial probability model be reasonable?

A) The number of traffic tickets written by each police officer in a large city during one month.
B) The number of hearts in a hand of five cards dealt from a standard deck of 52 cards that has been thoroughly shuffled.
C) The number of 7's in a randomly selected set of five random digits from a table of random digits.
D) The number of phone calls received in a one-hour period.
E) All of the above.