Quiz 4 for Statistics 301
Elementary Statistical Methods - Spring 1999
Material Covered: Chapter 8 of Workbook; Chapter 6 of text
For: 19th March

Name (please print): _____.
last first

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1. A lawyer, who presently represents 14 defendants, estimates she wins 27% of her cases. Assume this problem obeys the conditions of a binomial experiment.

(a) [1] The functional form of the binomial distribution in this case is given by (circle one)

(a) $C_{14,x}(0.27)^x(1-0.73)^{14-x}$ $x = 0, 1, 2, \ldots 14$
(b) $C_{14,x}(1-0.27)^x(0.73)^{14-x}$ $x = 0, 1, 2, \ldots 14$
(c) $C_{14,x}(0.27)^x(0.73)^{14-x}$ $x = 0, 1, 2, \ldots 14$
(d) $C_{14,x}(0.73)^x(0.27)^{14-x}$ $x = 0, 1, 2, \ldots 14$

(b) [1] The (exact) probability of winning 2 or 3 trials, using the binomial,

is _____.

(c) [1] The number of trials she expects to win, μ,

is _____.

(d) [1] The standard deviation in the number of trials she expects to win

is _____.

(e) [1] The binomial can be approximated by a normal, $Y \sim N(\mu, \sigma^2)$ where

$\sigma =$ _____.

(f) [1] The normal approximation to the exact probability of winning 2 or 3 trials

is given by _____.

(a) [1]The functional form of the binomial distribution in this case is given by (c) $C_{14,x}(0.27)^x(0.73)^{14-x}$ $x = 0, 1, 2, \ldots 14$

(b) [1] The (exact) probability of winning 2 or 3 trials, using the binomial, is $P(X = 2) + P(X = 3) = 0.377$

(c) [1] The number of trials she expects to win is $np = 14(0.27) = 3.78$

(d) [1] The standard deviation in the number of trials she expects to win $\sqrt{np(1-p)} \approx 1.66$

(e) [1]The binomial can be approximated by a normal, $Y \sim N(\mu, \sigma^2)$ where $\sigma = 1.66$

(f) [1]The normal approximation to the exact probability of winning 2 or 3 trial is given by $P(1.5 \leq Y \leq 3.5) \approx 0.348$