

(14pts) NAME (printed neatly): _____

(5pts) Section Number (circle correct section): 521_(9:10am) 522_(10:20am) 514_(11:30am) 525_(1:50pm)

1. A quiz consists of 3 multiple-choice questions. Each multiple-choice question has 4 choices with only one correct answer. Let the random variable X denote the number of questions answered correctly by a student randomly guessing.

a. (15pts) What is the exact probability, as a fraction, of a student getting exactly 2 correct answers by randomly guessing?

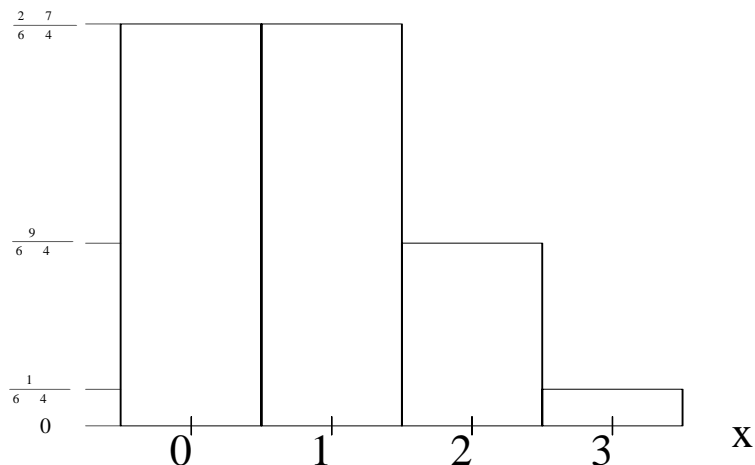
$$C(3,2) \left(\frac{1}{4}\right)^2 \left(\frac{3}{4}\right)^1 = 3 \left(\frac{1}{16}\right) \left(\frac{3}{4}\right) = \frac{9}{64} \quad \text{OR} \quad \text{binompdf}\left(3, \frac{1}{4}, 2\right) = \frac{9}{64}$$

b. (18pts) Complete the probability distribution table associated with this random variable X . Give all probabilities as fractions.

x	$(P(X = x))$
0	$C(3,0) \left(\frac{1}{4}\right)^0 \left(\frac{3}{4}\right)^3 = \frac{27}{64}$ OR $\text{binompdf}\left(3, \frac{1}{4}, 0\right) = \frac{27}{64}$
1	$C(3,1) \left(\frac{1}{4}\right)^1 \left(\frac{3}{4}\right)^2 = \frac{27}{64}$ OR $\text{binompdf}\left(3, \frac{1}{4}, 1\right) = \frac{27}{64}$
2	$C(3,2) \left(\frac{1}{4}\right)^2 \left(\frac{3}{4}\right)^1 = \frac{9}{64}$ OR $\text{binompdf}\left(3, \frac{1}{4}, 2\right) = \frac{9}{64}$
3	$C(3,3) \left(\frac{1}{4}\right)^3 \left(\frac{3}{4}\right)^0 = \frac{1}{64}$ OR $\text{binompdf}\left(3, \frac{1}{4}, 3\right) = \frac{1}{64}$

c. (8pts) Give the probability histogram associated with this probability distribution. Label your axes. Hint: The vertical axis' tick mark labels should be fractions.

$P(X = x)$



2. A survey was done in a horse community to find the number of horses per household. The results are given in the table. On the questions below remember the units!

Number of Horses	Number of Households
12	1
6	3
1	4
10	4
7	6
3	6

a. (10pts) To two decimal places, find the mean (expected value) of the number of horses.

1-Var Stats L1, L2 [must give this for full credit]

Mean is $\bar{x} \approx 5.58$ horses

b. (10pts) Find the exact median number of horses.

6 horses

c. (10pts) Find the exact mode of the number of horses.

3 and 7 horses

d. (5pts) Find the variance to 2 decimal places.

Variance ≈ 10.66

e. (5pts) Find the standard deviation to 2 decimal places.

$\sigma \approx 3.26$ horses