

Show your work clearly, neatly, and understandably. Make sure you round the decimal for probability to 4-decimal place and round the percentage to 2-decimal. There are 103 points available.

1. (Total 24) According to Gallup Poll conducted between January 14-19, 2014, Obama's approval rating among all voters is 39% and his disapproval rating is 53%, while the rest have no opinion.
 - a. (3) Of 15 voters, find the expected number of voters approving Obama.
 - b. (4) Of 25 voters, find the standard deviation of the number of voters disapprove Obama.
 - c. (5) Find the probability that, of 8 people, more than 5 of them approve Obama.
 - d. (5) Find the probability that any of those 8 people has/have no opinion.
 - e. (7) Of 50 voters, find the "usual" interval for the number of voters having no opinion.

2. (Total 19) A box contains 12 identical cards (except in colors): 5 red, 4 blue, and 3 green.
 - a. (4) Three cards are selected without replacement. Find the probability of selecting any green cards.

 - b. (5) A card is drawn randomly 5 times with replacement. Find the probability of getting a red card three times.

- c. (10) Create a probability distribution of the number of blue cards selected for a procedure of selecting three cards without replacement.

3. (Total 15:6,3,6) For each million tickets sold, the original New York Lottery awarded one \$50,000 prize, nine \$5,000 prizes, ninety \$500 prizes, and nine hundred \$50 prizes. Construct the probability distribution of the payout then extend to find its expected value and standard deviation.

7. (Total 17) A random sample of 50 purchases at a store produced the following contingency table for payment method and the size of purchase.

	<i>Cash</i>	<i>Credit</i>	<i>Debit</i>
		<i>Card</i>	<i>Card</i>
Under \$30	5	2	2
\$30 - \$100	2	10	9
Over \$100	1	12	7

- a. (3) Find the probability that a purchase is at most \$100.
- b. (3) Find the probability that a purchase is paid not by a credit card.
- c. (5) Given that a purchase is paid by a debit card, find the probability that it was at least \$30.
- d. (6) Given that a credit card purchase was at least \$30, find the probability that it was over \$100.