

- You must use a graphing calculator.
- At the end of class, be sure to turn in your formula sheet (1 sheet, 2 pages, hand-written), worth 10%.

1. (10 pts) The formula $=\$B\$2*A2$ is located in cell **B1**.

a) If this was copied and pasted into cell D3, what would the resulting formula be?

b) What would this new formula evaluate to?

	A	B	C	D
1	2	$=\$B\$2*A2$	4	5
2	3	3	8	6
3	5	4	3	?????????
4	4	3	4	9

1. (20 pts) A 5 digit PIN number can begin with any digit (except zero) and the remaining digits have no restriction.

a. If repeated digits are allowed, find the probability of the PIN code beginning with a 7 and ending with an 8.

b. If repeated digits are not allowed, find the probability of the PIN code is odd.

c. Find the probability that the PIN code is odd if repeated digits are allowed.

d. Are the events PIN is odd and PIN has no repeated digits independent?

2. (20 pts) Consider an experiment that consists of withdrawing a ball from the box, NOT replacing it, and withdrawing a second ball. There are 1 red, and 4 green ball in the box.

a. What is the sample space of this experiment? Is this a random variable? Why or why not?

b. Suppose that the experiment is carried further by counting the number of red balls selected? Why is this a random variable?

c. For the experiment described in b, find the outcomes and express their probabilities as quotients of binomial coefficients.

d. Evaluate the binomial coefficients, leaving as fractions and find the expectation.

- e. Find the variance for the random variable of c and d.
 - f. If X is RV indicating whether the first ball is red or not (1, 0 respectively) and Y is whether the second ball is red or not (1, 0 respectively). Find $E(X)$ and $E(Y)$ and show that their sum corresponds to your answer in d.
 - g. Find $V(X)$ and $V(Y)$ for X and Y described in f. and show that their sum DOES NOT correspond to your answer in d. Why not? Try to reason why it is more or less.
3. (20 pts) Records show that deaths occur at the rate of 0.1 per day among patients residing in a large nursing home.
- a. Provide 2 reasons why deaths are NOT Poisson distributed.
 - b. Assuming that they are Poisson distributed, find the chance that 2 or more patients will die in one week.
4. (20 pts) A random sample of 747 obituaries published recently in Salt Lake City newspapers revealed that 344 (or 46%) of the residents died in the three-month period following their birthdays. Assess the statistical significance of that finding by approximating the probability that 46% or more would die in that particular interval if deaths occurred randomly throughout the year. Solve the problem using the binomial distribution.
- a. Find the expectation.
 - b. Find the variance.
 - c. Draw the normal distribution graph using the information from a and b. (Normal distribution approximates the shape of the binomial distribution.) and shade the portions which corresponds to the question.
 - d. Solve the problem using a graphing calculator. Be sure to describe the syntax of any functions you use and your selection for any inputs.