

- 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%.
 - (10 pts) The formula $=\$B\$2*A2$ is located in cell **B1**.
 - If this was copied and pasted into cell D3, what would the resulting formula be?
 - 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

- (20 pts) Let $f_Y(y) = \frac{3}{2}y^2$, $-1 < y < 1$
 - Show that $f_Y(y)$ is a PDF.
 - Graph $f_Y(y)$ from $-1 < y < 1$ (plot every .25).
 - Find and graph the corresponding cdf: $F_Y(y)$ from $-1.5 < y < 1.5$ (plot every .5)
 - Find $P\left(\left|Y - \frac{1}{2}\right| < \frac{1}{4}\right)$. Graph the inequality on your graph from part b) and shade the area representing the probability.
 - Find the expectation and label on both graphs.
 - Find the median and label on both graphs (the first with a vertical line and the second with a horizontal line and a dotted vertical line).
 - Compare the relative positions of the median and the expectation. Explain how the comparison relates to any skewing.
 - Calculate the variance and standard deviation.

3. (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.
- What is the sample space of this experiment? Is this a random variable? Why or why not?
 - Suppose that the experiment is carried further by counting the number of red balls? Why is this a random variable?
 - For the experiment b, find the outcomes and express their probabilities as quotients of binomial coefficients.
 - Evaluate the binomial coefficients, leaving as fractions and find the expectation.
 - Find the variance for the random variable of c and d.
 - 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.
 - 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.
4. (20 pts) Records show that deaths occur at the rate of 0.1 per day among patients residing in a large nursing home.
- Provide 2 reasons why deaths are NOT Poisson distributed.
 - Assuming that the deaths are Poisson distributed:
 - Find the chance that 2 or more patients will die in one week.
 - If someone dies today, what are the chances that a week or more will elapse before another death occurs?
5. (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 a graphing calculator and the binomial distribution. Be sure to describe the syntax of any functions you use and your selection for any inputs.
 - Express the solution in terms of a standard normal distribution. Be sure to use a continuity correction.
 - Draw the graph and shade the corresponding answer to b.
 - Solve the problem using a graphing calculator and the standard normal distribution. Be sure to describe the syntax of any functions you use and your selection for any inputs.