Name _____

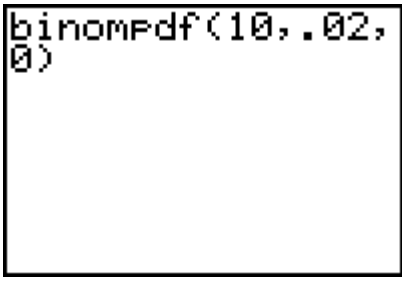
Class _____

Problem 1 – Exact Probabilities

To calculate the probability of exactly *r* successes in *n* Bernoulli trials is ${}_nC_r \cdot p^r q^{n-r}$.

This formula only works in trials where there is a binomial distribution and the events are independent of each other.

On the calculator, use the Bernoulli formula to determine the probability that a packet of ten memory chips with an average of 2% defective chips has no defects.

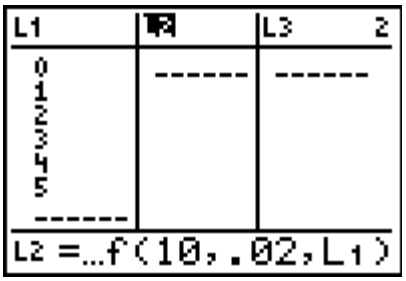


In this case, $n = 10$, $r = 0$, $p = 0.02$, $q = 0.98$

- $P(0) =$

Now, verify your calculations using the **Binomial Pdf** command. To access the command, press 2nd [DISTR].

To calculate the probabilities of 1, 2, 3, 4, and 5 defective memory chips, enter 0 through 5 in list **L1**. Then highlight **L2** and enter the formula **binompdf(10, 0.02, L1)**. Press ENTER. The probabilities for the respective number of defective chips are displayed.



Use the **L3** and **L4** to find the probabilities of defective chips in a packet of 25 chips with an average of 2% defective and a packet of 10 chips with an average of 30% defective.

Enter the probabilities in the table at the right.

r	*n* = 10 *p* = 0.02	*n* = 25 *p* = 0.02	*n* = 10 *p* = 0.3
0	.		
1			
2			
3			
4			
5			

- How does the distribution of probabilities for 30% defective compare to the distribution of 2% defective?

Problem 2 – Cumulative Probabilities

Let's explore the first example where memory chips were bought in packets of ten where 2% of the memory chips are defective on average. On home screen, calculate the probability that there are less than three defective memory chips.

Add together the probabilities of 0, 1, and 2 that were calculated in Problem 1.

- *P*(less than 3 defects) =

To verify your answer, use the **Binomial Cdf** command. To access this command, press 2nd [DISTR].