

Name: _____

Discrete Probability Distributions Review

1. For each probability distribution, determine the expected value.

k	$P(k)$
0	0.5
1	0.3
15	0.15
100	0.04
500	0.01

k	$P(k)$
10	0.2
20	0.2
30	0.2
40	0.2
50	0.2

- Mr. Grasley uses a spreadsheet to generate random numbers between 1 and 999 for a simulation. Explain why the numbers generated have a uniform distribution.
- Mr. Grasley rolls a special, 10-sided die with the numbers 0 through 9 printed on the faces. Find the expected value for each roll.
- Explain why the sum of two d6 dice rolls does NOT have a uniform distribution.
- The photocopier in the math office has a 99.9% success rate (on average, 1 in 1000 pages is **not** successfully printed). If Mr. Grasley prints 80 pages,
 - what is the expected number of failed pages?
 - what is the probability that exactly 1 page does not print successfully?
 - what is the probability that all 80 pages print successfully?
- In MDM4U there are 20 students, 8 of whom are left-handed. If Mr. Grasley selects 4 students at random to answer questions on the board,
 - what is the probability that exactly 1 of them is left-handed?
 - what is the probability that at least 2 of them are left-handed?
- Create a probability distribution table for a binomial distribution with $n = 4$ and $p = 0.3$.
- A new vaccine is 98% effective. If 200 people are vaccinated,
 - what is the expected number of people who are protected by the vaccine?
 - what is the probability all 200 people are protected by the vaccine?
- In the grade 12 class there are 240 students. 215 of those students use a cell phone on a daily basis. You randomly select a group of 20 of these students for a survey. From this group of 20,
 - what is the expected number of students who use a cell phone on a daily basis?
 - what is the probability that less than 18 students use a cell phone on a daily basis?