

### 15.3.5: Chapter 6 Lab

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Open the MINITAB file lab05.mpj from the website.

Find Probabilities for a Binomial Random Variable (**MINITAB>CALC>PROBABILITY DISTRIBUTIONS**)

1. In a poll conducted in January 2015, 72% of American adults rated protecting freedom of speech ahead of not offending others. Assume this is the true proportion. You sample 64 American adults. Let  $X$  be the number in the sample who rated protecting freedom of speech ahead of not offending others.
  - a. Determine the probability that 44 American adults or fewer in the sample rated protecting freedom of speech ahead of not offending others. (Cumulative Probability) Is this result unusual?
  - b. Determine the probability that 56 American adults or more in the sample rated protecting freedom of speech ahead of not offending others. (Cumulative Probability plus Rule of Complement) Is this result unusual?
  - c. Create a Probability Distribution Plot of this binomial distribution (Under Graph Menu in Minitab).
  - d. What is the mean, variance and standard deviation of  $X$ ?
  - e. Use the Empirical (68, 95 99.7) Rule to determine between what two values would you expect to find 95% of the values of the random variable  $X$ ? Is the result consistent with the graph?

Find Probabilities for a Poisson Random Variable (**MINITAB>CALC>PROBABILITY DISTRIBUTIONS**)

2. Strong earthquakes (of RM 5 or greater) occur on a fault at a Poisson rate of 1.45 per year.
  - a. Determine the probability of exactly 2 strong earthquakes in the next year. (Probability)
  - b. Determine the probability of at least 1 strong earthquake in the next year. (Cumulative Probability plus Rule of Complement)
  - c. Determine the probability of at least 1 strong earthquake in the next 3 years. (Cumulative Probability plus Rule of Complement)
  - d. Create a Probability Distribution Plot of this binomial distribution (Under Graph Menu in Minitab).

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