

Math Virtual Learning

**AP stats / Review of
Regression**

May 19, 2020



Lesson: May 19, 2020

Objective/Learning Target:

Students will review to process and meaning of least squares regression

Review #1

If the $P(A) = 0.25$ and $P(B) = 0.34$, what is the probability of the union of A and B if A and B are independent?

Review #2

An inspection procedure at a manufacturing plant involves picking three items at random and then accepting the whole lot if at least two of the three items are in perfect condition. If in reality 84% of the whole lot are perfect, what is the probability that the lot will be accepted?

Answers

1. Since they are independent we know the intersection of A and B is $P(A \text{ and } B) = 0.25(0.34)$, thus the union is $P(A \text{ or } B) = 0.25 + 0.34 - 0.25(0.34) = 0.505$
2. This meets the binomial condition. It is binary (perfect or not), independent (we assume that one item failing does not mean the others will), fixed number of trials (3 products), fixed probability of success 84%. Thus we can get the answer as the sum of two binomial probabilities $P(2 \text{ success}) + P(3 \text{ success}) = 0.84^3 + {}_3C_2(0.84)^2(0.16) = 0.931\dots$ we could also use the TI-83 or 84 calculator with $1 - \text{binomcdf}(3, 0.84, 1) = 0.931$. The 3 is the number of trials, 0.84 is the probability, 1 is the max number of success. We subtract answer from 1 to get the upper portion of distribution.

Least Squares Regression

It is likely that if I record multiple variables from the same sample, some of those variables are going to have an relation with each other. Years of education tends to mean higher income, taller people tend to have longer arms, and larger male elephants tend to have more progeny. Often times we can account for a larger standard deviation in a data set by associating it with other variables. This lesson reviews the least squares regression process in preparation for statistical test on the data the regression line.

[Least Squares Regression](#)

Extra Practice

[Free Response Problem](#)

[Answers](#)