

Unit 2 Discussion Example - First Response to a Classmate's Post

First response: Choose a classmate's post and using their probability table, find the probability such that $X \geq x$. How does this probability compare to your classmate's calculation for $X = x$? In your own words explain what the difference is and what this probability means in the context of their situation.

Using the scenario: Smartphone adoption among American young adults has increased substantially and mobile access to the Internet is pervasive. Fifteen percent of young adults who own a smartphone are "smartphone-dependent," meaning that they do not have home broadband service and have limited options for going online other than their mobile device. (Data extracted from "U.S. Smartphone Use in 2015," Pew Research Center, April 1, 2015.)

Sample size, $n = 10$

Number of events of interest, $x = 3$

Probability of event of interest, $\pi = 0.15 = 15\%$

The probability that $P(X \geq 3)$ can be found on this table in the green highlighted cell. The probability that 3 or more of the 10 young adults are smartphone dependent is about 18%. Using the CUMULATIVE tab of the Binomial.xlsx workbook:

Binomial Probabilities Table					
X	$P(X)$	$P(\leq X)$	$P(< X)$	$P(> X)$	$P(\geq X)$
0	0.1969	0.1969	0.0000	0.8031	1.0000
1	0.3474	0.5443	0.1969	0.4557	0.8031
2	0.2759	0.8202	0.5443	0.1798	0.4557
3	0.1298	0.9500	0.8202	0.0500	0.1798
4	0.0401	0.9901	0.9500	0.0099	0.0500
5	0.0085	0.9986	0.9901	0.0014	0.0099
6	0.0012	0.9999	0.9986	0.0001	0.0014
7	0.0001	1.0000	0.9999	0.0000	0.0001
8	0.0000	1.0000	1.0000	0.0000	0.0000
9	0.0000	1.0000	1.0000	0.0000	0.0000
10	0.0000	1.0000	1.0000	0.0000	0.0000

This probability is a little higher than the probability that exactly 3 of the 10 young adults are smartphone dependent.

$P(X = 3) \approx 13\%$ and $P(X \geq 3) \approx 18\%$. So, the probability of 3 young adults are smartphone dependent is a little less than if you consider the probabilities that 1, 2, or 3 young adults are smartphone dependent.