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Geogebra Lesson: Using the probability calculator to determine normal distribution and binomial probabilities

1. At the top of geogebra, click on the “view” button and in the drop down box click on “probability calculator”



1. Standard deviation looks as:

 

 change it to P ( -3 ≤ x ≤ 2)

1. Now click on the “ [ “ button

 

1. Change it to P (x ≥ 0.5)
2. What is the probability of P (x ≥ 0.5)? \_\_\_\_\_\_\_\_\_\_\_
3. Now click on the “ ] “ button
4. Change it to P (x ≤ 0.2)
5. What is the probability of P (x ≤ 0.2)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Explain what each of these buttons do:

 [ = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 [ ] = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 ] = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Now insert .9 as the probability to find the x value

 What is the x value of the probability of 0.9? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Using the probability calculator to calculate binomial probabilities

Binomial distribution can be written in the form: X~ B(n,p)

The random variable X ~ B(10,2/5). Find:

1. P(X=5) b. P(X=8) c. P (X is at least two)
2. Go to the button that says normal and clicking the blue button to the right of it. Scroll until you see the “binomial” button

 What does that button change? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. In our example our n is \_\_\_\_\_\_ and the probability of success (p) is \_\_\_\_\_\_\_

 To change this on the graph, change the n to 10 and the p to 2/5 = .4

1. To answer part **a** of the question, make x =5 by clicking the [ ] button and entering 5

 P (X=5) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Now let’s move on to finding the probability of x=8.

 How do we find the probability of x = 8?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 P (X=8) =\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. We know that if our n is 10, that the deviation goes as high as 10. In order to find out the probability when x is at least two we stay using the button [ ] and insert

 P (\_\_\_\_\_\_ ≤ x ≤ \_\_\_\_\_\_\_)

 P (X is at least two) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. At the top of the page where these buttons lie:

 

 Click on them to see the different ways to view the graph



**References:**

Project Maths Development Team. (2013). Geogebra statistics and probability. Retrieved from

 <https://www.projectmaths.ie/documents/PDF/GeoGebraForStatisticsAndProbability.pdf>

Willis, M. (2017). An introduction to the probability calculator in geogebra. Retrieved from

 <https://www.youtube.com/watch?v=3fiDmpbw5FY>