

## TECHNOLOGY CORNER for Section 6.3, Page 406

### 14. Geometric probability on HP Prime

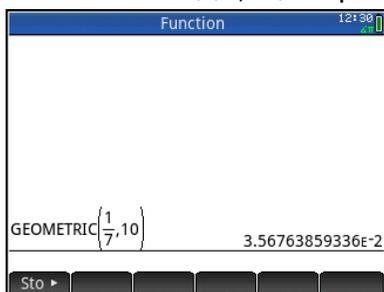
In this Technology Corner, we will use the HP Prime for two new commands to confirm our answers in the previous example. The inputs for both commands are the success probability  $p$  and the value(s) of interest for the geometric random variable  $Y$ :

$\text{GEO\_PDF}(p, k)$  computes  $p \cdot (1 - p)^{k-1}$  or  $P(Y = k)$

$\text{GEO\_CDF}(p, k)$  computes  $P(Y \leq k)$

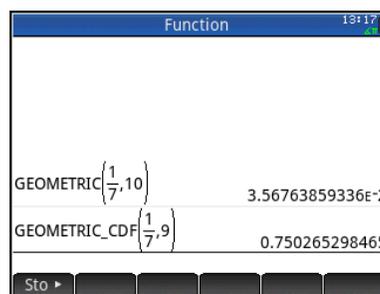
Let's use the Lucky Day example to compute geometric probabilities.

- Find the probability that the class receives exactly 10 homework problems as a result of playing the Luck Day game.
  - Press  for Home view
  - Press  and tap **Math** to open the Math menu.
  - Tap *Probability*, then *Density*, and select *Geometric*.
  - Enter  $\text{GEO\_PDF}(1/7, 10)$  and press .



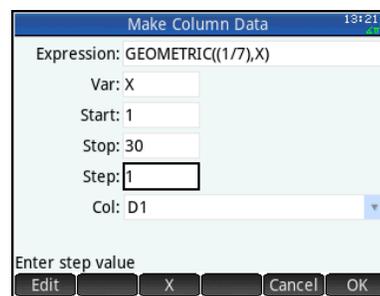
This result agrees with our previous answer using the geometric probability formula: 0.0357.

- Find  $P(Y < 10)$  and interpret this value in context.
  - Press  and tap **Math** to open the Math menu.
  - Tap *Probability*, then *Cumulative*, and select *Geometric*.
  - Complete the command  $\text{GEO\_CDF}(1/7, 9)$  and press .



These results agree with our previous answer using the geometric probability formula: 0.7503.

- Use our new  $\text{GEO\_PDF}$  command to plot the geometric probability distribution with  $p = 1/7$ 
  - Open the Statistics 1Var app and press .
  - Tap **Make**
  - Edit the following fields:
    - Expression:**  $\text{GEO\_PDF}(1/7, X)$
    - Stop:** 30



- Tap **OK** to see the first 30 probabilities in D1

Statistics 1Var Numeric View				
	D1	D2	D3	D4
1	0.14285714			
2	0.12244897			
3	0.10495624			
4	8.99625156			
5	0.07711072			
6	0.06609490			
7	5.66527798			
8	4.85595252			
9	4.16224502			
10	3.56763856			
0.142857142857				

Edit More Go To Sort Make Stats

- Press  to enter Symbolic view and set H1 as shown below

Statistics 1Var Symbolic View

✓ H1: D1

Plot1: Bar

Option1:

H2:

Plot2: Histogram

Option2:

H3:

Choose plot type

Choose ✓

- Press  and select *Autoscale* to see the plot of the first 30 terms of the distribution.

