

Chapter 14 / Example 3

Expected value

Calculating the expected value with a GDC

A random variable X represents the number of sixes obtained when a dice was rolled three times (which is also the number of sixes when three dice are rolled once). Here is the probability distribution.

x	1	2	3	4
$P(X = x)$	$\frac{125}{216}$	$\frac{25}{72}$	$\frac{5}{72}$	$\frac{1}{216}$

Find the expected value of X .

Open a new document and add a Lists & Spreadsheet page.

Type 'x' in the first cell.

Type the numbers 1, 2, 3, 4 in the first column.

Press **enter** or **▼** after each number to move to the next cell.

A	x	B	C	D
1	1			
2	2			
3	3			
4	4			
5				

Type 'p' in the cell to the right of 'age'.

Enter the probabilities of each number in the second column.

Use the **▲ ▼ ► ◀** keys on the touchpad to navigate the spreadsheet.

To enter the fractions type, for example, $125 \div 216$

A	x	B	p	C	D
1	1	125/216			
2	2	25/72			
3	3	5/72			
4	4	1/216			
5					

To calculate $E(X)$ from the table

Press **menu** 4:Statistics | 1:Stat Calculations | 1:One-Variable Statistics...

Click the touchpad on OK or press **enter**.

One-Variable Statistics

Num of Lists: 1

OK Cancel

Open the drop down lists with **►** and select using **▼** and **enter**.

Choose 'x' for X1 List and 'p' for Frequency List.

The next two choices remain empty.

The 1st Result Column can remain as c[] as this is the third column in the spreadsheet.

Press **enter** or use the touchpad to click OK.

One-Variable Statistics

X1 List: x

Frequency List: p

Category List:

Include Categories:

1st Result Column: c[]

OK Cancel

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The expected value of x is the mean, shown as \bar{x} .

$$E(X) = 1.5.$$

	A	x	B	p	C	D
=						=OneVar(
1		1	125/216	Title		One-Va...
2		2	25/72	\bar{x}		1.5
3		3	5/72	Σx		1.5
4		4	1/216	Σx^2		2.66667
5				$sx := s_n \dots$		#UNDEF...
D1 = "One-Variable Statistics"						