

Uniform continuous distribution

We'll use random numbers uniformly distributed between 20 and 30, but it's easy to use other distributions - see videos 82 and 85 for normal and binomial examples.

rand() generates a single random number between 0 and 1

randList(n) generates a list of n random numbers between 0 and 1.

fRound(a,b) rounds a to b decimal places

fRound(20+10×randList(25),1) generates a list of 25 random numbers between 20 and 30.

mean() calculates the mean of a list of numbers.

Just tap EXE to repeat simulation.

Recall that mean and standard deviation of a uniform distribution on the interval [a,b] is given by $\bar{x} = \frac{a+b}{2}$ and $sd = \frac{b-a}{2\sqrt{3}}$.

$\bar{x} = 25$, $sd = 2.887$

In Main, take a copy of the line to calculate the sample mean and then start a new spreadsheet, pasting the formula into cell A1.

Use Edit, Fill, Fill Range to copy the formula into cells A1 to A50.

Put cursor into cell B1 and use Calc, List-Statistics, mean to calculate the mean of the 50 samples, each based on a random sample of size 25.

Then cursor into B2 and repeat but use stdDev.

Select column A, tap Graph, Histogram.

Tap into the top window and use File, Recalculate to simulate measuring another 50 sample means.

You may want to File, Save your spreadsheet.

The histogram showing the distribution of sample means mostly resembles a normal distribution and the mean of these samples in cell B1 is close to the known population mean of 25.

The standard deviation of the sample means in cell B2 is close to $\frac{2.887}{\sqrt{25}} \approx 0.577$.

