Density Curves

ID: 11070

Time required
15 minutes

Activity Overview

In this activity, students will be introduced to density curves as a simple analysis of a data set. They also will investigate where the median and mean lie on symmetric or skewed graphs.

Topic: One-Variable Distributions

- *Smooth curves*
- *Mean and median*

Teacher Preparation and Notes

- *Students will need the student worksheet and the TI-Nspire document (.tns file) before the activity.*
- *Useful terms for this activity:*
    - *Uniform distribution: The height of each bar in the histogram is the same.*
    - *Symmetric distribution: Single peak with both sides approximately the same.*
    - *Skewed right: Tall extends to the right side.*
    - *Skewed left: Tall extends to the left side.*
- ***To download the student TI-Nspire document (.tns file) and student worksheet, go to education.ti.com/exchange and enter "11070" in the quick search box.***

Associated Materials

- *DensityCurves_Student.doc*
- *DensityCurves.tns*

Drawing Density Curves

Pages 1.2 through 1.4 give information about smooth curves and density curves. An example of a density curve for a symmetric or normal distribution is given on page 1.5.

Discuss how distributions with a large number of observations can be represented by a smooth curve, as it allows for a mathematical model to be found.

On the worksheet, students are to draw smooth curves to fit the histograms also shown on pages 1.6 through 1.9. Each histogram represents a different type of distribution: symmetric, skewed left, skewed right, and uniform.

Important discussion questions include:

• What is the general shape of the curve? Is it symmetric? Skewed? Uniform?

• What shape of curve would best describe the distribution? Why can outliers be ignored?

Student should check their curves using **Show Normal PDF** in the Analyze menu.
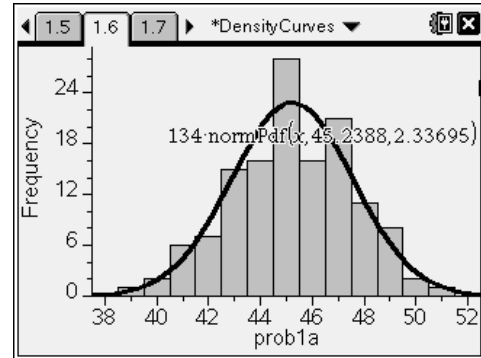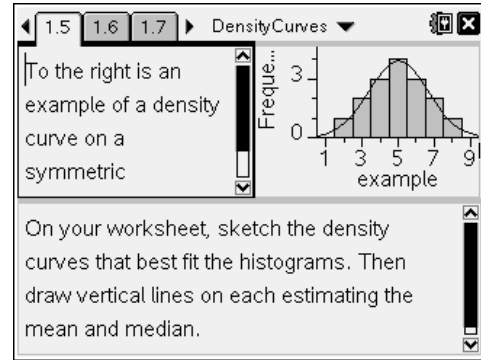
Mean & Medians in Histograms

On the worksheet, students will draw vertical lines to represent the mean and median on each histogram.

This activity is meant for students to work individually and make a conjecture as to where they lie. They will then use the **Plot Value** command to confirm and/or reject their conjectures.

Remind students that the *mean* is the point that balances the data and the *median* is the point that divides the data in two equal groups of data values.

Students should determine that the mean and median of a symmetric density curve are equal. The mean of a skewed curve is pulled away from the median in the direction of the long tail.