# Chapter 14 – 1a Area Between Curves

If and are continuous and on then the area bounded by and is given by

**Example 1.** Find the area bounded by



**Example 2.** Find the area bounded by



**Example 3.** Find the area bounded by



**Example 4.** As part of a study of the effects of World War II on the economy of the United States, an economist used data from the U.S. Census Bureau to produce the following Lorenz curves for the distribution of income in the United States in 1935 and in 1947:

In the Lorenz formulas, x is the proportion of families ( and y is the proportion of wealth () owned by those families.

The Gini index is the ratio of the area between the line and the Lorenz curve (A1) and the area between the line and the x-axis (A2). If the Lorenz curve is given by then

****The lower the Gini index, the more equal the distribution of income. A Gini index of 0 (the Lorenz curve is the line indicates absolute equality of income; the total income for the entire country is shared equally by all families. A Gini index of 1 (the Lorenz curve is on the x-axis) indicates absolute inequality; all of the income goes to just one family and nobody else has any income.

Find the Gini index for each Lorenz curve above and interpret the results.

**1935 Income Distribution**

**1947 Income Distribution**

In this case, the data indicates that the income was more evenly distributed in 1947 than it was in 1935.

Example 5. Lorenz curves and the Gini index can also be used to provide a relative measure of the distribution of assets (wealth) in a country. Using data in a report by the U.S. Congressional Joint Economic Committee, an economist produced the following Lorenz curves for the distribution of total assets in the United States in 1963 and in 1983.

Find the Gini index for the distribution of wealth for each year and interpret the results.

**1963 Wealth Distribution**

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**1983 Wealth Distribution**

The wealth in 1963 was concentrated in the hands of a relatively low number of families and this trend increased over the next twenty years to 1983.