

# MATH 1342

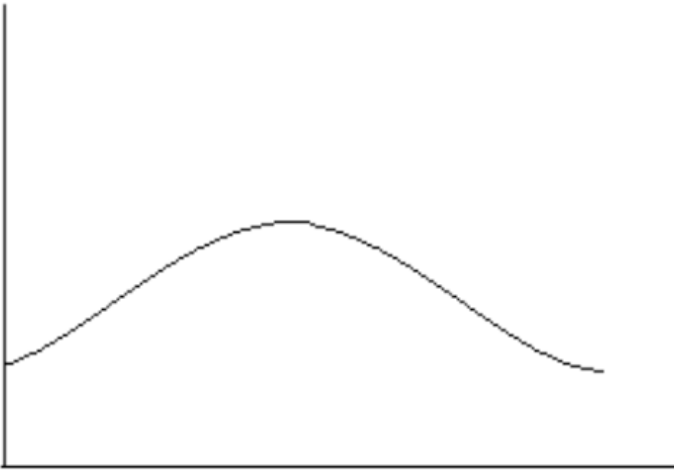
Section 4.1

# Density Curves

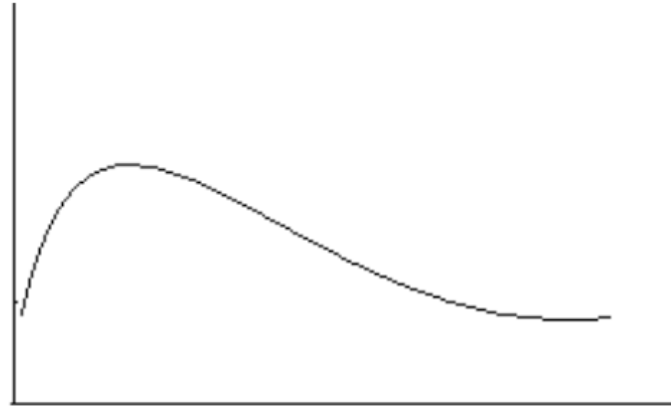
A *density curve* is a graph whose area between it and the x-axis is equal to one. These graphs come in a variety of shapes but the most familiar “normal” graph is bell shaped. The area under the curve in a range of values indicates the proportion of values in that range.

# Skewness and curves:

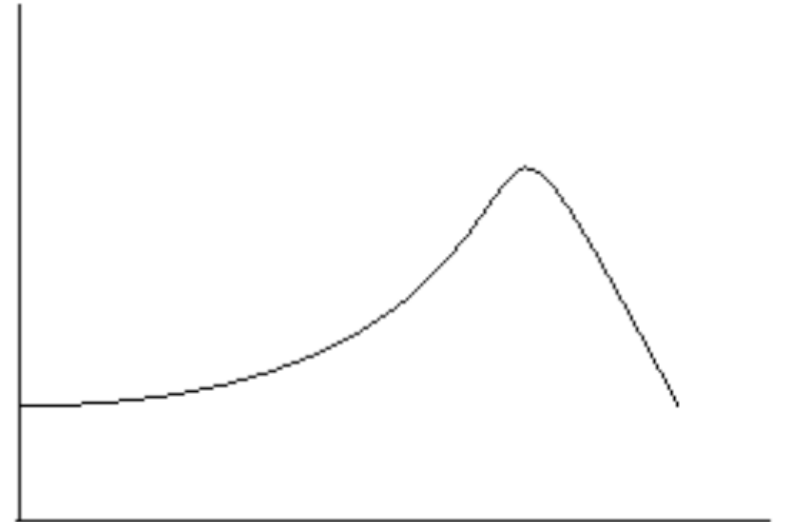
Bell Shaped (normal)



Skewed Right



Skewed Left

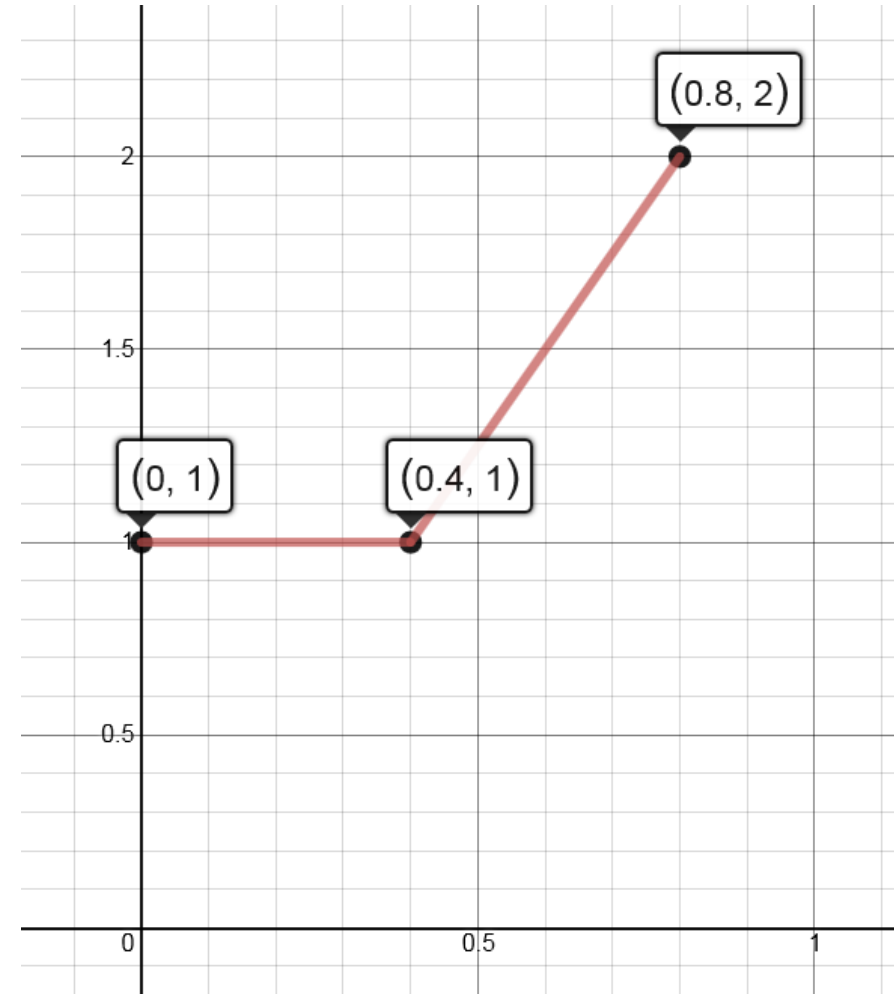


Example: Think about a density curve that consists of two line segments. The first goes from the point  $(0, 1)$  to the point  $(.4, 1)$ . The second goes from  $(.4, 1)$  to  $(.8, 2)$  in the  $xy$  plane.

Sketch:

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Sketch:

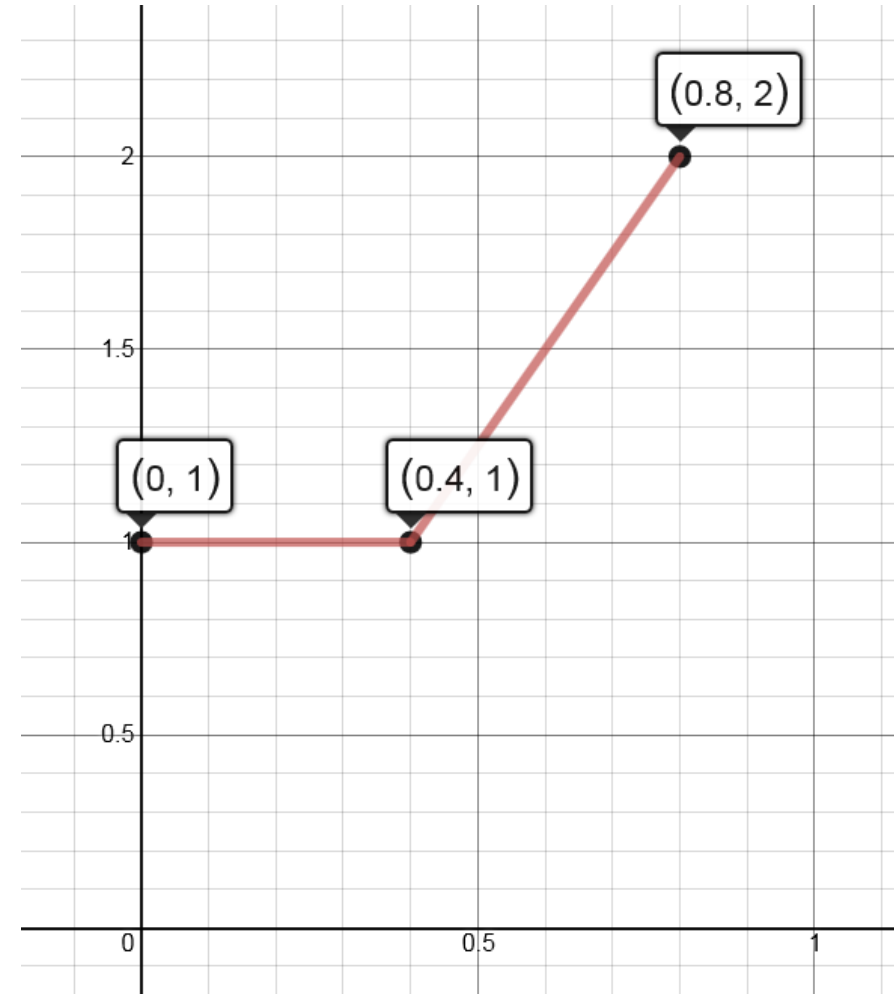


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What percent of observations fall below  $.4$ ?

What percent of observations lie between  $.4$  and  $.8$ ?

What percent of observations are equal to  $.4$ ?



Example: Consider a uniform density curve defined from  $x = 0$  to  $x = 6$ .

Sketch:

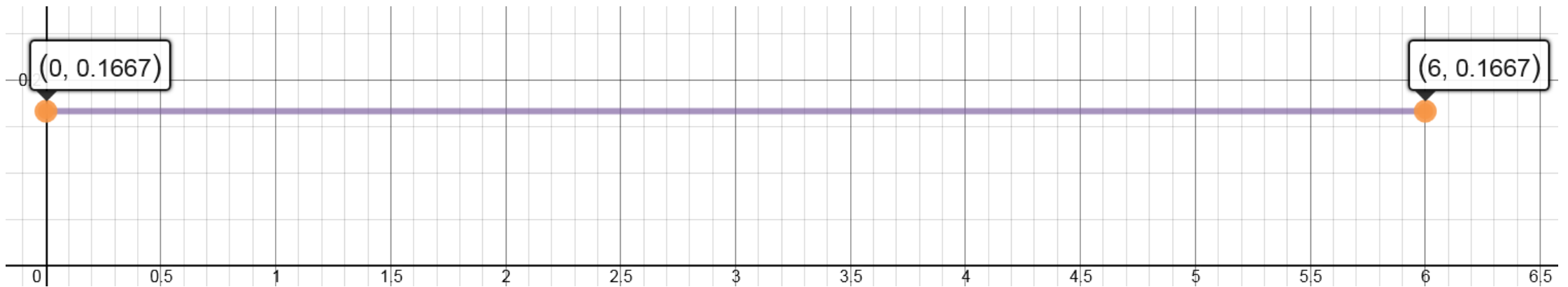
What percent of observations fall below 2?

What percent of observations lie between 2 and 3?

Find the median.

Example: Consider a uniform density curve defined from  $x = 0$  to  $x = 6$ .

Sketch:



What percent of observations fall below 2?

What percent of observations lie between 2 and 3?

Find the median.



## Another Example:

A probability density curve consists of two line segments. One segment connects the points  $(0, 2)$  and  $(0.25, 2)$ , and the other connects  $(0.25, 2)$  to the x-axis. Determine  $P(x > 0.35)$ .

