

# Density Curves

## Reading

- Section 5.1
- Section 5.2

## Practice Problems

**5.1 (Page 320)** 4, 12, 13, 14

**5.2 (Page 321)** 29, 30, 33

**5.2 (Page 326)** 74a-e, g-h, j, 74a-g, 78g, i

## Notes

- The book refers to them as “continuous probability functions”.
- Think of them like “smooth histograms”.
- Used to describe large (infinite) populations.
- Key property:

Area under the curve and between  $v_1$ ,  $v_2$  is equal to the percent of data values that are between  $v_1$  and  $v_2$ .

Total area under curve equals 1 (100%).

- To really compute things would need to know the equation of this curve, and do some Calculus.
- Some examples of distributions are easy to work with:

**Uniform** Straight line from  $a$  to  $b$ . Represents the idea that all numbers between  $a$  and  $b$  are equally likely.

**Normal** Has well known formula and tables to use. We will see this in next section.

## Uniform Distribution

- Graph is a straight line at height  $\frac{1}{b-a}$ , extending from  $x = a$  and  $x = b$ .
- Can compute areas as they are just rectangles.

**Shape** Symmetric

**Mean**  $\frac{a+b}{2}$

**Median**  $\frac{a+b}{2}$

**Std Dev**  $\sqrt{\frac{(b-a)^2}{12}}$

**Quartiles** One fourth and three fourths of the way from  $a$  to  $b$ .

**IQR**  $\frac{b-a}{2}$