**Normal Distribution**

One particularly important class of density curves are the **Normal curves**, which describe **Normal distributions**.

* All Normal curves are symmetric, single-peaked, and bell-shaped
* A Specific Normal curve is described by giving its mean *µ* and standard deviation σ.
* We abbreviate the Normal distribution with mean *µ* and standard deviation σ as *N*(*µ,σ*).

**The 68-95-99.7 Rule**

* Approximately **68%** of the observations fall within σ of *µ.*
* Approximately **95%** of the observations fall within 2σ of *µ.*
* Approximately **99.7%** of the observations fall within 3σ of *µ.*



Example: 1 The distribution of Iowa Test of Basic Skills (ITBS) vocabulary scores for 7th grade students in Gary, Indiana, is close to Normal. Suppose the distribution is *N*(6.84, 1.55).

1. Sketch the Normal density curve for this distribution.
2. What percent of ITBS vocabulary scores are less than 3.74?
3. What percent of the scores are between 5.29 and 9.94?

Example 2: The distribution of the heights of adult females is *N*(64.5, 2.5).

1. Sketch the Normal density curve for this distribution.
2. What percent of females are taller than 67 inches?
3. What percent of females are between 59.5 inches and 64.5 inches?

**The Standard Normal Distribution**

The **standard Normal distribution** is the Normal distribution with mean 0 and standard deviation 1.

 z =

**The Standard Normal Table**

**Table A** is a table of areas under the standard Normal curve. The table entry for each value *z* is the area under the curve to the left of *z*.

Examples: **P(*z* < 0.81) =**

**P(*z* > 0.81) =**

**P(*z* < -1.25) =**

Find the proportion of observations from the standard Normal distribution that are between -1.25 and 0.81.

When Tiger Woods hits his driver, the distance the ball travels can be described by *N*(304, 8). What percent of Tiger’s drives travel between 305 and 325 yards?