

**Problem 1.** You are being tested for arachnophobia. It is known that 30% of people have arachnophobia. There are three spider pictures; they include a Goliath birdeater tarantula spider, a black widow spider, and a Brazilian wandering spider. Those who have arachnophobia shiver  $\frac{9}{10}$  of the time when shown one of the pictures. Those who do not have arachnophobia shiver  $\frac{1}{5}$  of the time they are shown a picture of a black widow. (And whether a person shivers or not when seeing one picture is independent from whether the person shivers or not when shown another picture.)

- (a) You are shown three pictures and never shiver. What is the probability you have arachnophobia?
- (b) You are shown three pictures and always shiver. What is the probability you have arachnophobia?
- (c) You are shown three pictures and shiver exactly twice. What is the probability you have arachnophobia?
- (d) You are shown three pictures and shiver exactly once. What is the probability you have arachnophobia?