

Example 1

A couple has three children. Find the probability of each event.

- a) Among three children, there is exactly one girl.
- b) Among three children, there are exactly two girls.
- c) Among three children, all are girls.

Example 2

A pollster contacts **84** people in the 18-21 age bracket and finds that **73** of them respond and **11** refuse to respond. When **275** people in the 22-29 age bracket are contacted, **255** respond and 20 refuse to respond. Assume that 1 person out of 359 people is randomly selected. Find the probability of getting someone who is in the 18-21 age bracket or someone who responded.

Example 3

According to the U.S. National Vital statistics Reports, in all of 2006, **0.8%** of live births were delivered by forceps, and **3.7%** were delivered by vacuum extraction. What is the probability that a live baby was delivered without the use of either forceps or vacuum extraction?

Example 4

Intuitive Multiplicative Rule Illustration

A standard deck of 52 playing cards contains 26 red and 26 black cards.

- a) If two cards are selected *with replacement*, what is the probability that both cards are red?
- b) If two cards are selected *without replacement*, what is the probability that both cards are red?

Example 5

Multiplicative Rule Illustration

From public health records, the percentages of A, B, O, and AB blood types are, respectively, 40%, 20%, 30%, and 10%. If two individuals are picked at random from this population, assuming independence, find the probability that

- They are both type A.
- They are both of the same blood types.
- Neither is of blood type A.
- One is of blood type A and the other is of blood type O.
- They are both of different blood types.

Example 6: #20, p.117

Assume that a surgeon's alarm clock has a **0.975** probability of working on any given morning. With one alarm clock, the surgeon has a 0.975 probability of being awakened. What is the probability of being awakened if she uses two alarm clock?

Example 7

The state of Florida reports that 75% of all patients first diagnosed with a spinal cord injury are male. What is the probability that the next two patients diagnosed with a spinal cord injury in Florida will be male?

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- But the left hand side is zero whereas the right hand side is non-zero. This contradiction leads us to conclude that mutually exclusive events can't be independent.