Section 4.2: cont'd:

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Example: At the Red Barn Market, you can get an ice-cream cone with two scoops of ice-cream chosen from the following: chocolate, vanilla, strawberry, and mint. Let's say that customers always choose two different flavors for their scoops and that the cone with vanilla on top is the same as the cone with vanilla on the bottom. Let's further say that when averaged over all customers, each flavor is equally likely to be chosen.

a) How many different ice-cream cones are possible? If a random customer makes an order, what probability does a particular cone have to be picked?

brute force:

CV VS SM
CS VM
CM

note: or use combination (later this chapter)

6 different cones are possible, each with probability 1/6.

b) What's the probability that a random customer will order chocolate as one of the two scoops?

$$P(C) = \frac{n(C)}{n} = \frac{3}{6} = \boxed{\frac{1}{2} \text{ or } 50\%}$$

c) What's the probability that a customer will order chocolate or vanilla?

$$P(C \text{ or } V) = \frac{n(C \text{ or } V)}{n} = \frac{5}{6}$$

d) Calculate (c) again but using a different method.

$$P(C \text{ or } V) = 1 - P(\overline{C \text{ or } V})$$

$$= 1 - P(5M)$$

$$= 1 - 1/6 = 5/6$$

e) Calculate (c) yet again using yet another method.

$$P(C \text{ or } V) = P(C) + P(V) - P(C \text{ and } V)$$ (both)

$$= 3/6 + 3/6 - 1/6$$

$$= 5/6$$