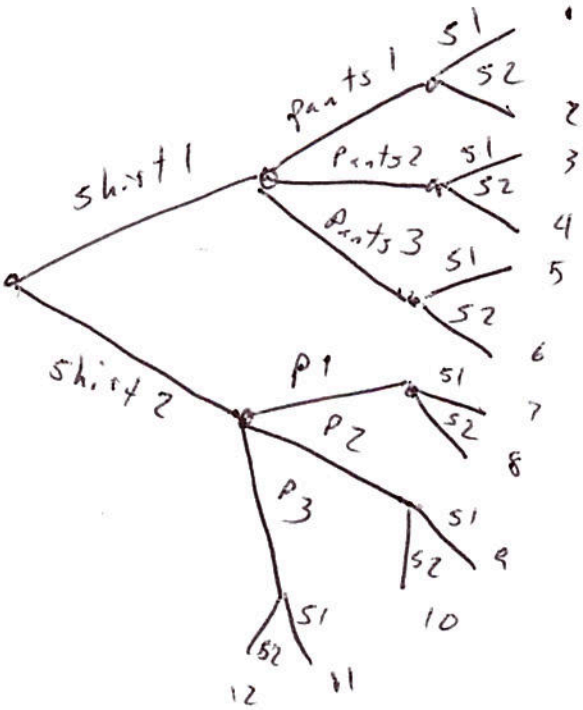
Section 11.1

The Fundamental Counting Principal

We are moving into Probability. We have to be able to count efficiently.

I have two shirts, three pairs of pants, and two pairs of shoes. How many outfits can I put together?



I can dress in 12 different outfits.

$2 \cdot 3 \cdot 2 = 12.$

Section 11.1

The fundamental counting principal
The number of ways in which a series of successive things can occur is found by multiplying the number of ways in which each thing can occur.

Example: A certain model of car comes in 7 different colors, with 3 different choices for rims, with an option for two different sound systems. How many distinct ways can the car be ordered?

$$7 \cdot 3 \cdot 2 = 42$$

42 different ways.

Section 11.1

A multiple choice test has 20 questions
Each question has four choices.
If you answer all 20 and leave
nothing blank, in how many ways
can you answer the questions?

$$\underbrace{4 \cdot 4 \cdot \ldots \cdot 4}_{20 \text{ times}}$$

$$4^{20} \approx 1.0995 \times 10^{12}$$

~~110 Billion~~ ways

1,099,950,000,000

1,099,500,000,000

About 1.1 trillion
ways.