Test Results

A XXXXX

B XXXX

C XXXXXXX

D XXXXX

F XXXXX

avg 73

3 Green

$x - \bar{x}$ $\qquad$ $(x-\bar{x})^2$

sum column

$$\sum (x-\bar{x})^2 = 284$$

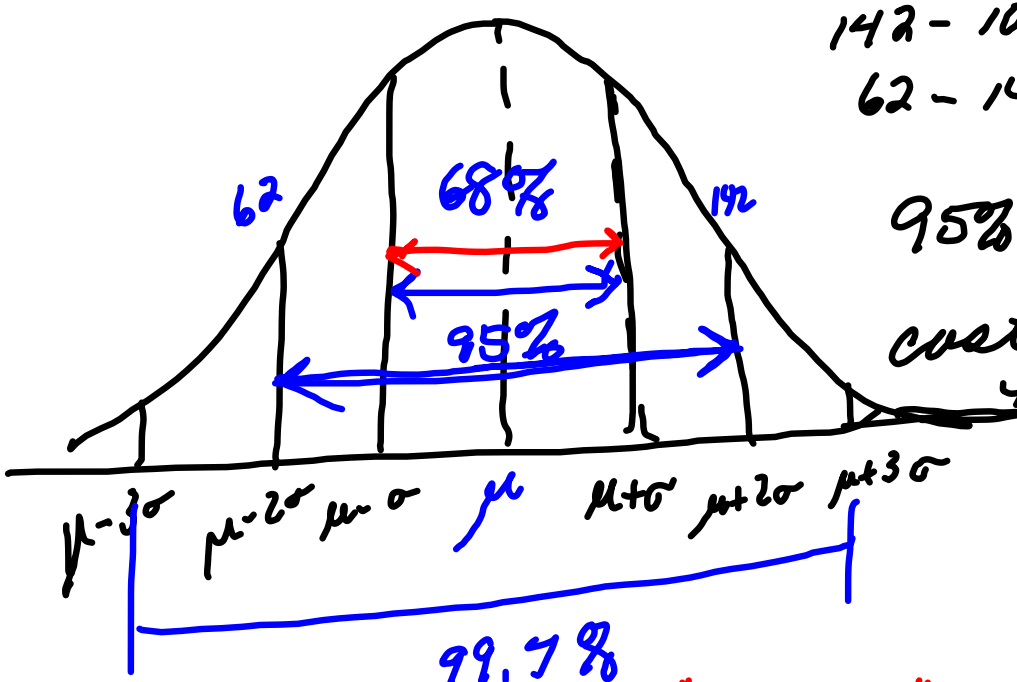
$$s^2 = \frac{\sum (x-\bar{x})^2}{n-1} = \frac{284}{7} \approx 40.5714$$

$$s = \sqrt{40.5714} \approx 6.37$$

⑥ Green

$\bar{x} = \$102$ $\sigma = \$20$

a) all textbooks between $62 and $142



$142 - 102 = 40 = 2\sigma$

$62 - 142 = -40 = -2\sigma$

95% of the books cost between $62 and $142

⑥ a) $\sigma = 25$ $\mu = \$100$ $\$75$ and $\$125$

$125 - 100 = 25$ 1σ

$75 - 100 = -25$ -1σ

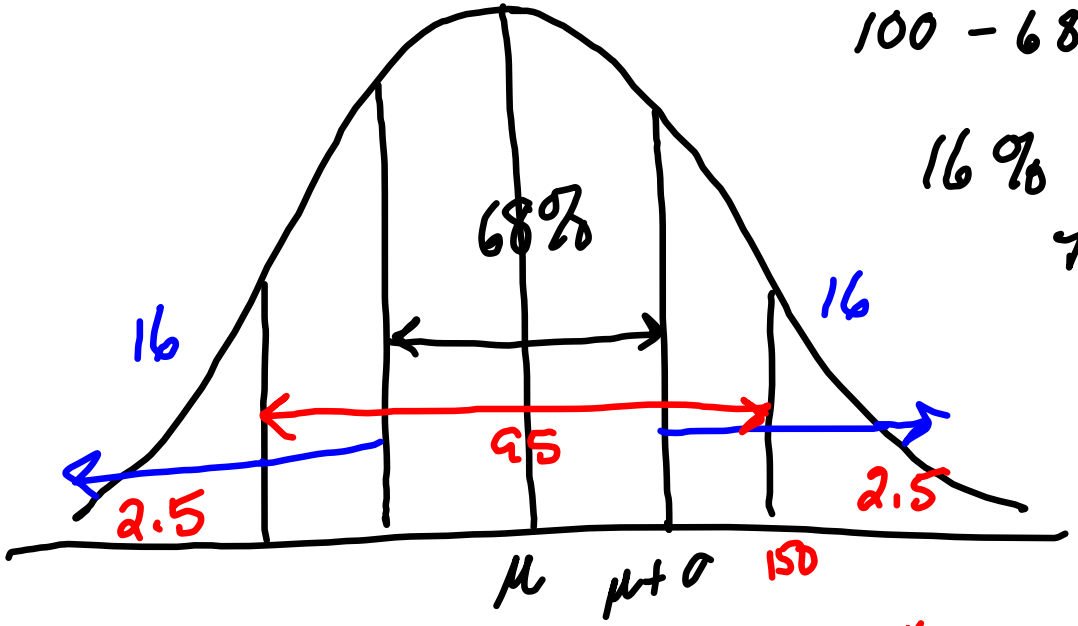
68% are between $75 and $125

6 b) Green more than $122

122 − 102 = 20 1σ

100 − 68 = 32%

16% cost more than $122



Pink b) Cost more than $150

150 − 100 = 50 2σ

100 − 95 = 5%

2.5% cost more than $150

Green

(6)

x	f	m	mf	m^2f
10 to < 20	14	15	210	3150
20 to < 30	23	25	575	14375
30 to < 40	15	35	525	18375
40 to < 50	10	45	450	20250
50 to < 60	8	55	440	24200

$\sum f = 70 \quad \sum mf = 2200 \quad \sum m^2f = 80350$

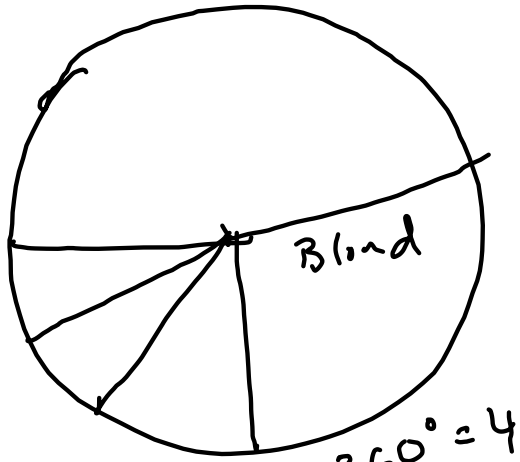
$$\bar{x} = \frac{\sum mf}{\sum f} = \frac{2200}{70} \approx 31.43$$

$$s^2 = \frac{\sum m^2f - \frac{(\sum mf)^2}{n}}{n-1} = \frac{80350 - \frac{(2200)^2}{70}}{69}$$

$$\approx 162.4223$$

$$s = \sqrt{162.4223} \approx 12.74$$

Black	1300	.1200
Brown	5200	.4802
Blond	2655	.2452
Red	1025	.0946
gray	650	.0600
	$\sum$ = 10830	$\sum$ = 1.0000



Black .1200 × 360° = 43.2 ≈ 43
Brown .4802 × 360° = 172.872 ≈ 173
Blond .2452 × 360° = 88.272 ≈ 88
Red .0946 × 360° = 34.056 ≈ 34
Gray .0600 × 360° = 21.6 ≈ 22

360°

Chapter 4 - Experimental Outcomes & sample space.

An experiment - a process that, when performed, results in one and only one of many possible outcomes.

Experiment	Outcomes	Sample Space
Take a test	A, B, C, D, F	$S = \{A, B, C, D, F\}$
Toss a coin twice	HH, HT, TH, TT	$S = \{HH, HT, TH, TT\}$

An event consists of one or more outcomes of the experiment

simple (elementary) event includes only one outcome

$E_1 = \{HH\}$ $E_2 = \{HT\}$

$E_3 = \{TH\}$ $E_4 = \{TT\}$

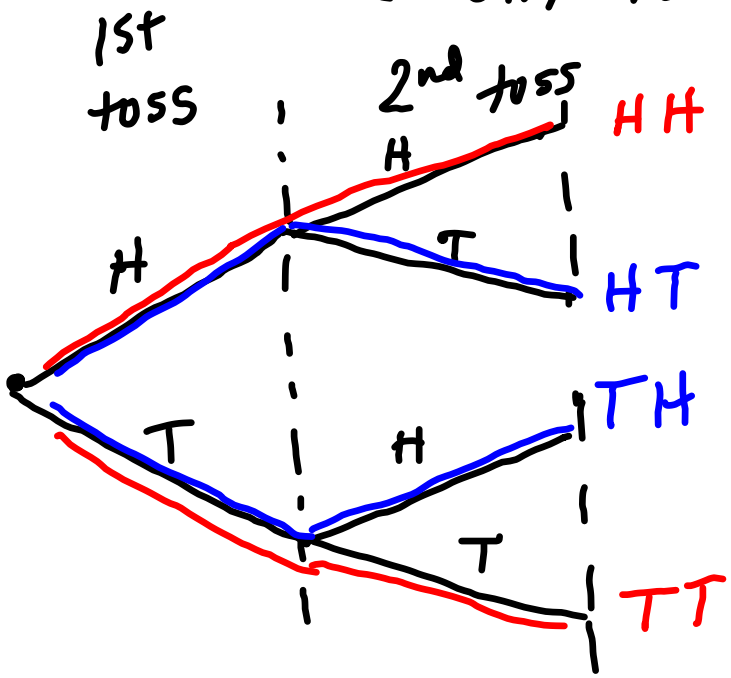
compound (composite) event - collection of 2 or more events

$A_1 = \{HT, TH\}$

E_1

TREE

toss a coin twice



4 possible events

4.2

Probability - numerical measure of the likelihood that a specific event will occur.

$P(E)$

probability of E occurring.

between 0 and 1

$0 \leq P(E) \leq 1$

Sum of all probabilities of all simple events of one experiment must total 1. one

$\sum_{i=1}^{n} P(E_i)$ is always 1

Toss a coin

$P(H) + P(T) = 1$

Types of Probability

1st

Theoretical probability
(classical probability)

events are all equally likely
(have same probability of occurring)

$$P(E) = \frac{1}{\text{total \# of outcomes}}$$

Coin toss $P(T) = \frac{1}{2}$

for compound event $P(A) = \frac{\text{\# of outcomes favorable to A}}{\text{total \# of outcomes}}$

toss coin twice?

$P(\text{one H}) = \frac{2}{4} = \frac{1}{2}$ $\quad A = \{HT, TH\}$

HH
HT —
TH —
TT

Single Coin toss $P(H) + P(T)$

$\frac{1}{2} + \frac{1}{2}$

1

$.5 + .5 = 1$

$P(TT) = \frac{1}{4} = .25$

$P(\text{not } TT) = \frac{3}{4} = .75$

$P(TT) + P(\text{not } TT) = .25 + .75 = 1$

Throw a die $S = \{1, 2, 3, 4, 5, 6\}$

What is the probability we get a 3 or a 5?

$$P(3 \text{ or } 5) = \frac{2}{6}$$

$$= \frac{1}{3}$$

$$= .\overline{33}$$

2nd Type - Relative frequency
(experimental or Empirical)

Must do an experiment to gather data

(ex) What is the probability that the next person through the airport metal detector makes it beep?

law of large numbers

$$P(\text{sets alarm off}) = \frac{\#\text{ that set it off}}{\text{total \# of people}}$$

3rd Subjective Probability - based on subjective judgement, experience, information and belief.

(Least reliable)

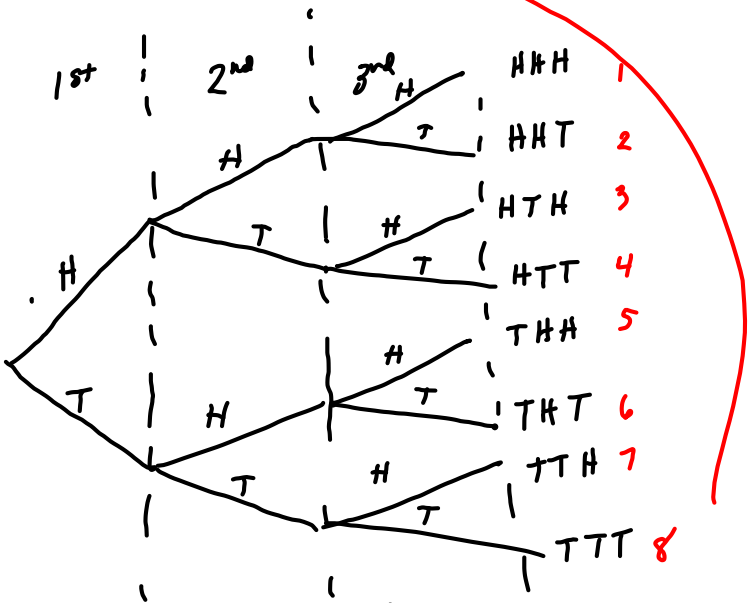
43 **The counting rule**

If an experiment consists of 3 steps and if step one as m outcomes, the 2nd has n outcomes, and the 3rd has k outcomes, total possible outcomes are

$$m \cdot n \cdot k$$

Toss 3 times

$2 \cdot 2 \cdot 2 = 8$



Toss a coin & then rolled a die

$2 \cdot 6 = 12$ possible outcomes

(24) 4.50

pg 155

4 suits
8 shirts
12 ties
} all coordinated

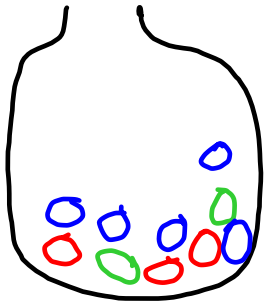
What are the possible combinations

suits X # shirts X # ties

4 . 8 . 12

384 different combinations are possible

Jelly Beans



Blue 5
Red 3
Gree 2
10 total

$P(\text{Green}) = \frac{2}{10} = .20$

$P(\text{Blue}) = \frac{5}{10} = .50$

$P(\text{Red} = \frac{3}{10} = .30$

$P(\text{G and R}) = \left(\frac{2}{10}\right)\left(\frac{3}{9}\right)$ without replacement

$= \frac{6}{90} = \frac{3}{45} = \frac{1}{15} = .0667$

$P(2GR) = \left(\frac{2}{10}\right)\left(\frac{1}{9}\right)$

$= \frac{2}{90}$

$= \frac{1}{45}$

Draw a King from a 52 card deck

$$P(K) = \frac{4}{52} = \frac{1}{13}$$

$$P(2^{nd} K) = \frac{3}{51} = \frac{1}{17}$$

replace cards

$$P(\text{red Ace}) = \frac{2}{52} = \frac{1}{26}$$