

Chapter 17 – Changed Slides

Odds...

- What are the odds?
 - Related to, but different than probability
 - Odds range from 0 to infinity, while probability can range from 0 to 1
 - Want to convert them to probabilities
- **Odds in terms of 2 numbers: A to B**
 - Odds **FOR** the outcome
 - Odds of A to B **FOR** an outcome means probability of outcome is $A / (A + B)$
 - “Odds of 5 to 1 **FOR** team winning” means $A=5$ and $B=1$
Probability of the team winning is $A / (A + B) = 5 / (5 + 1) = 5/6$
 - That is, “the probability of the team winning is 5/6.”
 - Odds **AGAINST** the outcome
 - Odds of A to B **AGAINST** an outcome means probability against the outcome is $B / (A + B)$
 - “Odds of 5 to 1 **AGAINST** team winning” means $A=5$ and $B=1$
Probability of the team winning is $B / (A + B) = 1 / (5 + 1) = 1/6$
 - That is, “the probability of the team winning is 1/6.”

iClicker questions:

- If the odds are 18 to 2 **for** a team winning, then the probability of the team winning is estimated to be:

- A. $2/16 = 0.125$
- B. $2/18 = 0.111$
- C. $2/20 = 0.100$
- D. $16/18 = 0.889$
- E. $18/20 = 0.900$

Odds **for** team winning are 18 to 2 means $A=18$ and $B=2$

$$\begin{aligned} P(\text{"18 to 2"}) &= A / (A + B) \\ &= 18 / (18 + 2) \\ &= 18 / 20 = 0.900 \end{aligned}$$

- If the odds are 18 to 2 **against** a team winning, then the probability of the team winning is estimated to be:

- A. $2/16 = 0.125$
- B. $2/18 = 0.111$
- C. $2/20 = 0.100$
- D. $16/18 = 0.889$
- E. $18/20 = 0.900$

Odds **against** team winning are 18 to 2 means $A=18$ and $B=2$

$$\begin{aligned} P(\text{"18 to 2"}) &= B / (A + B) \\ &= 2 / (18 + 2) \\ &= 2 / 20 = 0.100 \end{aligned}$$

Notes:

- Probabilities are intuitive for us to understand – they give us the chances of something happening.
- Odds are.....well just the odds. It is a different way to quantify the likelihood of something happening.