

Math 1313 Odds

Formulas

Odds and probability do not mean the same thing, although they are related.

You often hear about odds in the context of gambling. For example, a certain race horse with a good racing record entered in the Kentucky Derby may have odds listed as 5 to 2. The odds that an unheard of horse with no track record behind him might be listed as, say, 30 to 1.

What we want to look at is the relationship between odds and probability. We also want to be able to solve problems involving odds.

If $P(E)$ is the probability of an event E occurring, then

- the odds in favor of E occurring are

- the odds against E occurring are

- If the odds in favor of E occurring are a to b , then the probability of E occurring is

- If the odds in favor of E occurring are a to b , then the probability of E not occurring is

These four formulas, and especially the last two, should be all you need to solve odds problems.

Examples 1 – 2

Example 1: A salesperson believes that the odds she will close a sale on any given day are 3 to 2. What is the probability that she will close a sale today?

Example 2: The probability of an event E occurring is $P(E) = .28$.

- What are the odds in favor of E occurring?

- What are the odds against E occurring?

Examples 3 – 4

Example 3: The odds that I will not finish my project by Friday are 5 to 4. What is the probability that I will finish the project by Friday?

Example 4: An attorney predicts that the odds he wins a certain case are 10 to 3. What is the probability that he will not win the case?