Math 3201

3.2 Making Decisions Based on Probability and Odds

The easiest way to make a decision when probabilities or odds are known is to write the probabilities as fractions, and convert them to decimal form so that a comparison can be made between the numbers.

Example 1:
A hockey game ended in a tie after a 5 minute overtime period. The winner will be decided by shootout. The coach must decide whether Ellen or Brittany should go first. She would prefer to use the best scorer first, so she will base her decision on the players' shootout record. Who should coach pick?

Player	Attempts	Goals Scored
Ellen	13	8
Brittany	17	10

Ellen: $P = \frac{\text{fav}}{\text{total}} = \frac{8}{13} = 0.615$ or 61.5%

Brittany: $P = \frac{10}{17} = 0.588 = 58.8\%$

Coach should pick Ellen.

Example 2:
A group of Grade 12 students are holding a charity carnival to support a local animal shelter. The students have created a dice game that they call Bim and a card game they call Zap. The odds against winning Bim are 5:2 and the odds of winning Zap are 3:7. Which game should Madison play?

Bim: 5 : 2 ← odds against winning
↑ lose ↑ win
total = 5 + 2 = 7
$P = \frac{2}{7} = 0.286$ or 28.6%

Zap: 3 : 7 ← odd in favour of winning
↑ win ↑ lose
total = 3 + 7 = 10
$P = \frac{3}{10} = 0.3$ or 30%

Madison should play Zap.

Practice:
A medical school conducted a study and learned that the odds of a vaccinated person NOT getting sick is 7:3,and the odds of a person not vaccinated getting sick is 21:29. Should you get vaccinated? Explain.

Vaccinated: 7 : 3
not sick sick
total = 7 + 3 = 10
$P = \frac{3}{10} = 0.3$ or 30%

Unvaccinated: 21 : 29
sick not sick
total = 21 + 29 = 50
$P = \frac{21}{50} = 0.42$ or 42%

Textbook Questions: page 148, 149: 1, 2, 3, 5, 7, 9, 11, 14, 16, 17