THEORETICAL PROBABILITY: This is what we THINK should happen. Remember there are 37 spaces on the roulette wheel.

A) A single number

$$\frac{1}{37} = .027 = 2.7\%$$

B) Two adjoining numbers

$$\frac{2}{37} = .054 = 5.4\%$$

C) Street

$$\frac{3}{37} = .081 = 8.1\%$$

D) Corner

$$\frac{4}{37} = .108 = 10.8\%$$

E) Column

$$\frac{12}{37} = .324 = 32.4\%$$

F) Dozen

$$\frac{12}{37} = .324 = 32.4\%$$

G) 1-18 or 19-36

$$\frac{18}{37} = .486 = 48.6\%$$

H) Red or Black

$$\frac{18}{37} = .486 = 48.6\%$$

I) Even or Odd

$$\frac{18}{37} = .486 = 48.6\%$$

↓ NOT A PERCENT

EXPECTED VALUE: Expected value of an event tells you how much you expect to win for each probability. So the payout of the event times the probability of that event actually occurring. This represents the actual money amount you would expect for each event. ($ times Probability) = $

MONEY × PROBABILITY = MONEY

YOU EXPECT TO WIN $.95

PROBABILITY OF THE EVENT

PAYOUT FROM FRONT

A) A single number

$$\$35\left(\frac{1}{37}\right) = \$.95$$

B) Two adjoining numbers

$$\$17\left(\frac{2}{37}\right) = \$1.92$$

C) Street

$$\$11\left(\frac{3}{37}\right) = \$.89$$

D) Corner

$$\$8\left(\frac{4}{37}\right) = \$.86$$

E) Column

$$\$2\left(\frac{12}{37}\right) = \$.65$$

F) Dozen

$$\$2\left(\frac{12}{37}\right) = \$.65$$

G) 1-18 or 19-36

$$1\left(\frac{18}{37}\right) = \$.49$$

H) Red or Black

I) Even or Odd

EXPECTED VALUE WHEN YOU HAVE TO PAY TO PLAY: Remember that this isn't 'free money'. We have to pay in order to play. So even though I may expect to win $0.94 I had to PAY $1 to play. So we have to

EXPECTED VALUE WHEN YOU HAVE TO PAY TO PLAY: Remember that this isn't 'free money'. We have to pay in order to play. So even though I may expect to win $0.94 I had to PAY $1 to play. So we have to subtract the payment from the expected winnings.

A) A single number

$$\$.95 - \$1 = \$ -.05$$

B) Two adjoining numbers

$$\$.92 - \$1 = \$ -.08$$

C) Street

$$\$.89 - \$1 = \$ -.11$$

D) Corner

$$\$.86 - \$1 = \$ -.14$$

E) Column

$$\$.65 - \$1 = \$ -.35$$

F) Dozen

G) 1-18 or 19-36

$$\$.49 - \$1 = \$ -.51$$

H) Red or Black

I) Even or Odd

QUESTION: Why are they all negative?

— YOU PAY TO PLAY

— THE AMOUNT YOU WIN DOES NOT COVER WHAT IT COSTS TO PLAY

LET'S PLAY!!!!!

11, 13, 14, 15

b) What is your payout if you win?

$8

c) What is the theoretical probability of your bet?

$4/37 = 10.8\%$

d) Multiply your probability times 40. This represents the **number of times** you **expect to win** (round to the nearest whole number).

EXPECT TO WIN

$\left(\frac{4}{37}\right) 40 = 4.32 = 4$ TIMES

e) How many times do you need to win to make a profit? (This would be at least one more win than what you expected).

AT LEAST 5

Use the table below to keep track of each spin that occurs