

arm-up

Find the probability that a number selected at random from the set of numbers 5, 6, 7, 10, 12, 14, 17, 21, 28, 30 will be divisible by 7.

Find how many different ways can the letters of the word number be arranged if each arrangement begins with a vowel?

Consider a bag that contains 15 white, 10 green, 8 blue marbles, and 7 red marbles. What is the probability of drawing a green, red, then white marble without replacement? Red, red, then blue? White, blue, then red? Green, red, blue, green, then red?

Tuesday 2/7/17 1.6 Expected Value

- The sum of the probability of each possible outcome of the experiment multiplied by its payoff. It represents the average amount one expects to win per bet if bets with identical odds are repeated many times.



Ex. 1: You receive an A 40% of the time, a B 20% of the time, a C 15% of the time, and a D the rest of the time. What grade can you expect to receive (A=4, B=3, C=2, & D=1)?

$$4(.4) + 3(.2) + 2(.15) + 1(.25) = \underline{2.75}$$

$$40 + 20 + 15 = 75 \quad 100 - 75 = 25$$



Ex. 2: There is a lottery of 1000 tickets; every ticket costs \$1. The lottery has the following prizes: one ticket wins \$500, 5 tickets win \$50 and 20 tickets win a \$10 prize.

$$500\left(\frac{1}{1000}\right) + 50\left(\frac{5}{1000}\right) + 10\left(\frac{20}{1000}\right) - 1\left(\frac{974}{1000}\right) =$$

$$1 + 5 + 20 = 26$$

$$1000 - 26 = 974$$

$$\left(-\frac{3}{125} \right. \\ \left. \text{or } -.024 \right)$$

5

Ex. 3: A coin is flipped. Heads, you win \$1.
Tails, you lose \$1.

a) What are the possible outcomes?

Heads $\frac{1}{2}$
Tails $\frac{1}{2}$

b) What are your expected winnings?

$$1\left(\frac{1}{2}\right) - 1\left(\frac{1}{2}\right) = 0$$

Ex. 4: Again, a coin is flipped. Heads, you win \$1. Tails, you lose \$2.

a) What are the possible outcomes?

Heads $\frac{1}{2}$
Tails $\frac{1}{2}$

b) What are your expected winnings?

$$1\left(\frac{1}{2}\right) - 2\left(\frac{1}{2}\right) = \frac{1}{2} - 1 = -\frac{1}{2} = -.5$$

Ex. 5: A quiz has 4 questions: a True-False question, 2 multiple choice questions each with 3 choices and a multiple choice question with 4 choices. If a student randomly guesses at each of the questions, what is the expected number of questions he will answer correctly?

$$\begin{array}{c} 1 \left(\frac{1}{2} \right) + 2 \left(\frac{1}{3} \right) + 1 \left(\frac{1}{4} \right) = \boxed{1.4167} \\ \text{T/F} \qquad \text{MC}_3 \qquad \text{MC}_4 \end{array}$$