

1. In a board game, players take turns spinning a wheel with 4 spaces and values of \$100, \$300, \$400, \$800. The probability of landing on \$100 is  $\frac{4}{9}$ . The probability of landing on \$300 is  $\frac{2}{9}$ . The probability of landing on \$400 is  $\frac{2}{9}$ . The probability of landing on \$800 is  $\frac{1}{9}$ . What is the expected value of spinning the wheel once?

$$\frac{4}{9}(100) + \frac{2}{9}(300) + \frac{2}{9}(400) + \frac{1}{9}(800)$$
$$44.44 + 66.67 + 88.89 + 88.89 = \$288.89$$

2. In question 1 what is the expected value of spinning the wheel 5 times?

3. Jennifer is playing a game at an amusement park. There is a 0.1 probability that she will score 10 points, a 0.2 probability that she will score 20 points, and a 0.7 probability that she will score 30 points. How many points can Jennifer expect to receive by playing the game?

$$.1(10) + .2(20) + .7(30)$$
$$1 + 4 + 21 = 26 \text{ points}$$

4. Juan is playing a game in which he can win \$100 with probability 0.1, \$200 with probability 0.2, or \$300 with probability 0.7. What is the expected value of Juan's winnings?

$$.1(100) + .2(200) + .7(300)$$
$$10 + 40 + 210 = \$260$$

5. Rudy is purchasing a toaster. Of the toasters in the store, 70% cost \$10, 20% cost \$20, and 10% cost \$50. How much can Rudy expect to pay for a toaster?

$$.7(10) + .2(20) + .1(50)$$
$$7 + 4 + 5 = \$16$$

6. Marina is playing a game in which she needs to throw a ball into a bucket. If she throws the ball into the bucket, she will win \$100; if not, she will win \$0. The probability that Marina will throw the ball into the bucket is 0.2. What is the expected value of Marina's winnings?

$$.2(100) + .8(0)$$
$$20 + 0 = \$20$$

7. Matt wants to purchase a book at Jo's Bookshop. Of the books in the shop, 60% cost \$10 and 40% cost \$12. How much can Matt expect to pay for a book at Jo's Bookshop?

$$.6(\$10) + .4(\$12) =$$

$$6 + 4.8 = \$10.80$$

8. Linda estimates the number of questions she answered correctly on a test. She answered 10 correctly with probability 0.6, 20 correctly with probability 0.3, and 50 correctly with probability 0.1. What is the expected value of the number of questions Linda answered correctly?

$$.6(10) + .3(20) + .1(50) =$$

$$6 + 6 + 5 = 17$$

9. Benjamin plays a game in which he will win 110 points with probability 0.6 and 120 points with probability 0.4. What is the expected number of points that he will win by playing the game?

$$.6(110) + .4(120) =$$

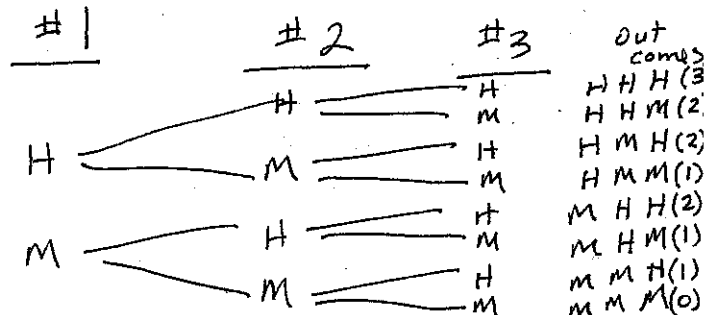
$$66 + 48 = 114$$

A bean bag toss game has the following rules:

- You get 3 bean bags to toss into the clown's mouth.
- If you make 3 successful tosses, then you win a large prize.
- If you make 1 or 2 successful tosses, then you win a small prize.
- If you make 0 successful tosses, then you do not win a prize.
- It costs \$1 to play (3 bean bag tosses).

10. What is the probability of each outcome?

- a. 3 successful tosses?  $\frac{1}{8}$   
 b. 2 successful tosses?  $\frac{3}{8}$   
 c. 1 successful toss?  $\frac{3}{8}$   
 d. 0 successful tosses?  $\frac{1}{8}$
- $\frac{6}{8}$  or  $\frac{3}{4}$



11. If 200 people play the bean bag toss game, how many of each prize (small and large) should you expect to give away?

- a. Small prizes?  $\frac{3}{4}(200) = 150$   
 b. Large prizes?  $\frac{1}{8}(200) = 25$

12. If a small prize costs \$0.50 and a large prize costs \$1, how much profit would you expect the game to make from the 200 players?

<u>Revenue</u>	-	<u>Cost</u>	=	<u>Profit</u>
200(\$1)	-	150(\$0.50) 25(\$1)	=	\$100