IM 2 Unit 3 Probability and Expected Value **Name:** **Period:**

SHOW ALL WORK!

1. Dunkin' Delilah Jones is at the foul line in a one-and-one situation with just seconds left in the game. (A one-and-one situation means that Delilah shoots a free throw and if she makes the shot, she shoots another. If she misses the first shot, she does not get a second shot. Each shot made is worth one point.) She has a 60% free throw average.

a. Use an area or tree diagram to represent the sample space.

Check Answers:

.96	3.9
8.75	
.36 or 36%	3/8
.40 or 40%	7/8
.24 or 24%	
No (explain)	

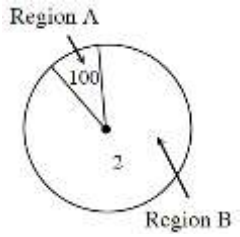
b. What is the most likely of the three possible outcomes? Calculate these probabilities:

P(0 points) P(1 point) P(2 points)

c. On average, how many points would you expect Dunkin' Delilah to make in a one-and-one free throw situation? That is, what is the <u>expected value</u>?

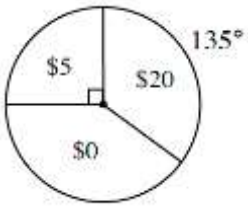
A	P	A·P

2. Using the spinner at right. If the central angle of Region A is 7°, calculate the <u>expected value</u>.



3. The spinner at right has three regions: \$5, \$0, and \$20. To play the game, you spin one time and then you win the amount in the region that the spinner lands on.

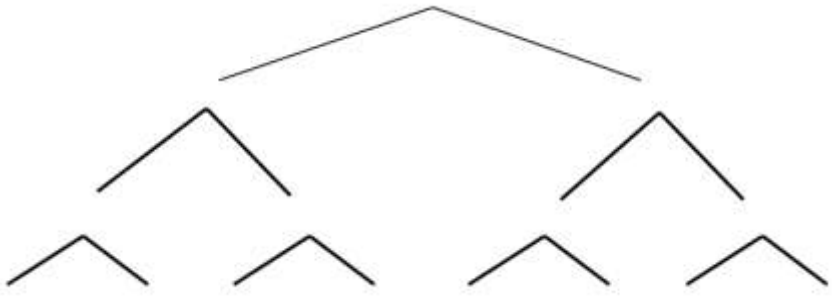
a. What is the <u>expected value</u> for the game?



b. If you have to pay \$10 to play, is it a fair game? Explain.

4. Han has three coins. Suppose these coins are flipped.

a. Make <u>a tree diagram</u> that includes a list of all possible combinations of heads and tails.

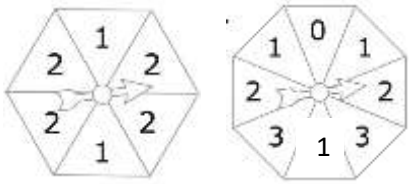


List of possible outcomes:

b. What is the probability that **<u>at least</u>** one coin comes up heads?

c. What is the probability that you get <u>exactly</u> 2 tails?

5. The two spinners shown to the right are spun. You spin each spinner once.
If the spinner lands on a different number each spin then you will win $100.
If the numbers match, then you will lose $20.



a. Make an <u>area diagram</u> for the problem.

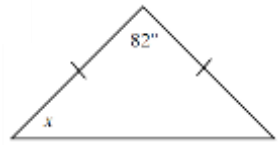
b. What is the probability that you will win?

c. What is the probability that you will lose?

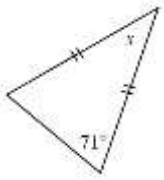
d. Calculate the expected value. Is this game fair?

6. Use the geometric relationships in the diagrams below to solve for x.

a.



b.

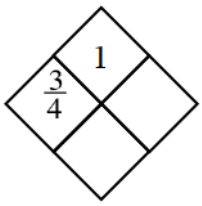


7. Multiply the expressions. (Show work)

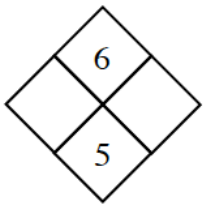
a. $(3x + 2)(4x - 5)$ b. $(4x - 1)^2$ c. $(3x + 2)^2$

8. Complete each of the Diamond Problems below.

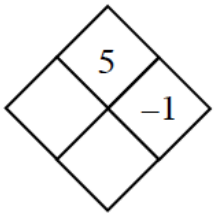
a.



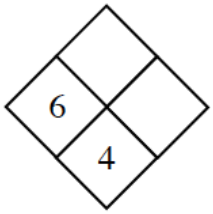
b.



c.



d.



Check Answers: 49 7/24 4/ 3 25/12 -5 -6 38 $16x^2-8x+1$ -12 -2 65

2 3 17/24 $9x^2+12x+4$ $12x^2-7x-10$