Name:_____ Date:_____

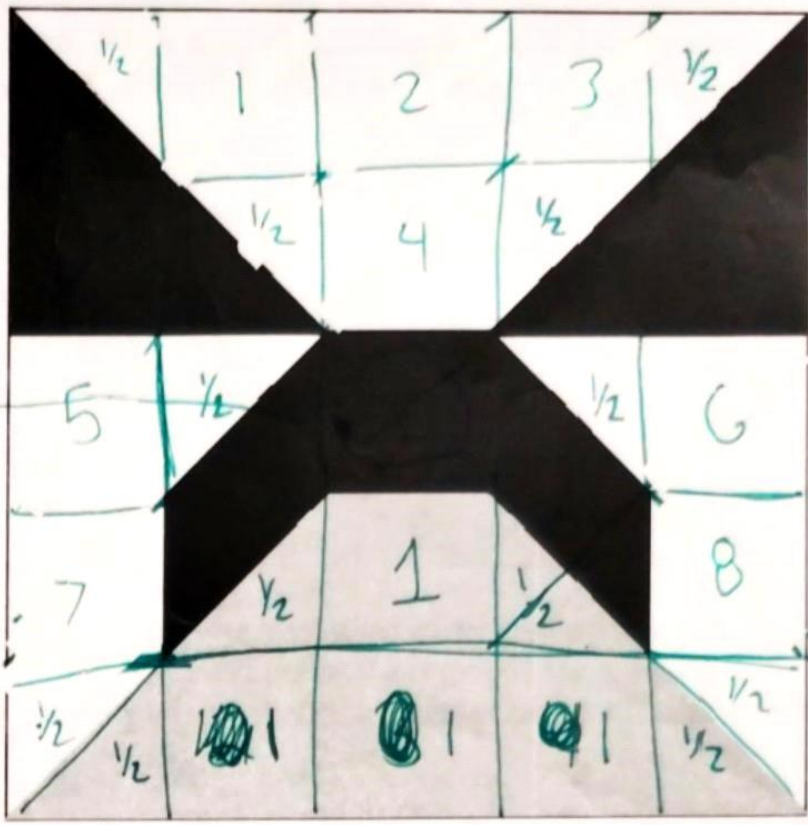
AMDM Unit 2: Probability Review

1) Given the area rug, determine the probability of getting Black, Gray, or White

BLACK: $\frac{3+2+2}{25} = \frac{7}{25} = .28$

GRAY: $\frac{6}{25} =$

WHITE: $\frac{8+8(\frac{1}{2})}{25} = \frac{12}{25} =$



$1+\frac{1}{2}+\frac{1}{2}$

2

$1+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}=3$

1b) A dart is randomly thrown at the board, if it lands on black you win $7, if it lands on gray you win $8, if it lands on white you win $4. What is the expected value of each color? If you could only bet on one color which would you bet on and why?

$4+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}+\frac{1}{2}$

YOU CAN COUNT BY SQUARES OR TRIANGLES. I COUNTED BY SQUARES SO 25 TOTAL SQUARES

BLACK $\left(\frac{7}{25}\right)\$7 = \$1.96$

GRAY $\left(\frac{6}{25}\right)\$8 = \$1.92$

WHITE $\left(\frac{12}{25}\right)\$4 = \$1.92$

YOU SHOULD BET ON BLACK BECAUSE YOU EXPECT THE HIGHEST PAYOUT COMPARED TO GRAY OR WHITE.

1 — — — 10 (GRADES DUE!) 10

2) Mrs. Martinez is a local elementary school teacher trying to prepare her students for the upcoming spelling bee. She is trying to encourage them to keep trying even if they get a question wrong. If they get a word spelled correctly on the first try then they get to sit down ~~and do not need to spell any more words~~ AND WAIT FOR THE NEXT WORD. If they get the word wrong then they must try a second time. (they only try spelling the word twice before a new word is selected). Maria spells words correctly 80% of the time. Determine the probability of the following

Getting the word right on the first try	Getting the word wrong but getting it correct on the second try	Getting the word wrong on both tries
80%	$(.20)(.80) = .16$ 16%	$(.20)(.20) = .04$ 4%

2b) The teacher awards 8 points for getting the word spelled correctly on the first try, 4 points for spelling the word correctly on the second try and no points for spelling the word incorrectly both times. What is Maria's expected point value on spelling a word?

$8(.80) + 4(.16) + 0 = 7.04$ POINTS

3b) Maria wants to earn 200 points. How many words should she expect to spell to earn at least 200 points?

$\frac{200}{7.04} = 28.4$ words

So she should expect to spell at least 29 words to make sure she gets her 200 points

HOMECOMING!

3) Drake and Mark created a carnival game involving rolling two dice. You can win money based off of different combinations of rolls. Below are the following combinations and amounts you can win. Double 6's get the $6 prize

Rolling a sum of 5	Rolling a sum of 2	Rolling doubles	Rolling a sum of 11 or higher
$3	$10	$1	$6

a) Find the probability of getting each event

Sum of 5 → $\frac{4}{36}$

Sum of 2 → $\frac{2}{36}$

Doubles → $\frac{6}{36}$

11+ → $\frac{3}{36}$

b) Drake and Mark are trying decide if they should charge $1 or $2 for their game. Which would you suggest and why? (Use expected value to justify your response)

$\left(\frac{4}{36}\right)\$3 = .33$

$\left(\frac{2}{36}\right)\$10 = .56$

$\left(\frac{6}{36}\right)\$1 = .14$

$\left(\frac{3}{36}\right)\$6 = .5$

$+$

$\$1.53$ 1.53

1,1 1,2 1,3 1,4 1,5 1,6

2,1 2,2 2,3 2,4 2,5 2,6

3,1 3,2 3,3 3,4 3,5 3,6

4,1 4,2 4,3 4,4 4,5 4,6

5,1 5,2 5,3 5,4 5,5 5,6

6,1 6,2 6,3 6,4 6,5 6,6

SINCE THE EXPECTED VALUE OF THIS GAME IS $1.53 DRAKE AND MARK NEED TO CHARGE MORE THAN THAT TO MAKE A PROFIT. IF THEY ONLY CHARGE $1 THEN THEY EXPECT TO LOSE $.53 PER PLAY BUT IF THEY CHARGE $2 THEN THE EXPECT TO PROFIT $.47 PER PERSON.

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$\left(\frac{4}{36}\right)\$3 = .33$

$\left(\frac{2}{36}\right)\$10 = .56$

$\left(\frac{6}{36}\right)\$1 = .17$

$\left(\frac{3}{36}\right)\$6 = .5$

$+$

$\$1.53$ 1.53

1,1 1,2 1,3 1,4 1,5 1,6
2,1 2,2 2,3 2,4 2,5 2,6
3,1 3,2 3,3 3,4 3,5 3,6
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