

AMDM: Unit 2 – Calculating Probabilities

2.3: Area Models

Name: Key
Date _____

1. In a game at the carnival, you must roll a fair, six-sided die numbered 1-6 and flip a fair, two-sided coin with heads and tails.

a. Draw an area model to represent the situation

	1	2	3	4	5	6
H	H1	H2	H3	H4	H5	H6
T	T1	T2	T3	T4	T5	T6

outcomes = 12

b. Find the following probabilities:

P(rolling a number greater than 5 on the die) =

$$2/12 = \frac{1}{6}$$

P(rolling an even number and flipping heads) =

$$\frac{3}{12} = \frac{1}{4}$$

P(rolling a 1 and flipping tails) = $\frac{1}{12}$

P(rolling a number greater than 3 and flipping tails) = $\frac{3}{12} = \frac{1}{4}$

c. If in order to win the game, you had to roll a prime number AND flip a tails, what would be the probability that you would win the game?

$$\frac{3}{12} = \frac{1}{4}$$

2. A pizza restaurant sells two different crusts (regular and thin-crust) and three different types of toppings (pepperoni, sausage, and bell peppers). Draw an area model to represent the situation.

CRUST	R	RP	RS	RB
	T	TP	TS	TB
		P	S	B

TOPP

3. In a videogame, you must enter, unlock a door to a secret chamber, and then open a locked chest to beat the level. The door to the secret chamber will open 70% of the time, and the locked chest will open 50% of the time.

a. Draw an area model to represent the situation:

0 to Sec Chamber
C 30

Chest L 50 U 50	.35	.15
	.35	.15

b. Find the following probabilities:

$$P(\text{not opening the secret chamber}) = .15 + .15 = .3$$

$$P(\text{opening the secret chamber but not the locked chest}) = .35$$

$$P(\text{not opening the secret chamber but opening the locked chest}) = .15$$

$$P(\text{beating the level}) = .35$$

4. Coach decided to stop grading test and quizzes... Instead she will determine grades by picking a marble (yellow, red, or blue) from one jar and a cube (yellow, red, or green) from another jar.

a. Draw an area model to represent the situation.

cube
y r g

marble b r y	by	rb	gb
	ry	rr	rg
	yy	yr	yg

b. Find the following:

$$P(\text{red marble and yellow cube}) = \frac{1}{9}$$

$$P(\text{at least one red of either item}) = \frac{5}{9}$$

- c. If Coach decide to only give A's to the students from whom she chooses a marble and cub that are the same color what is the probability that you will get an A?

$$\frac{2}{9}$$