AFM Unit 1 Probability Homework Packet

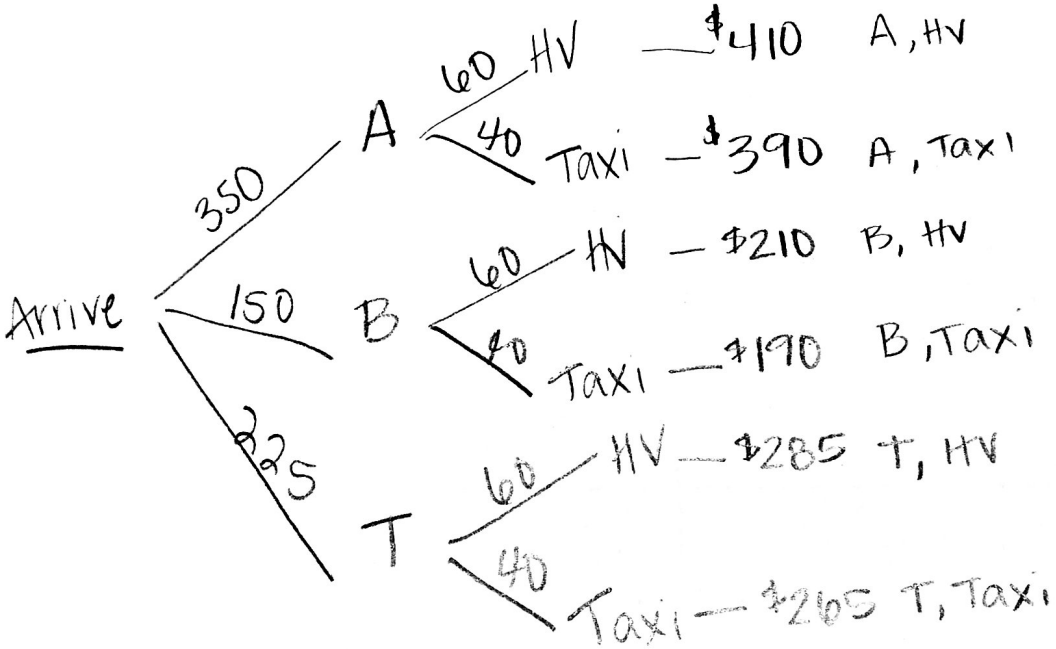
Name: Ms. Brooks Date: 1st & 2nd

Travel Time

A travel agent plans trips for tourists from Chicago to Miami. He gives them three ways to get from town to town: airplane, bus, train. Once the tourists arrive, there are two ways to get to the hotel: hotel van or taxi. The cost of each type of transportation is given in the table below.

Transportation Type	Cost
Airplane	$350
Bus	$150
Train	$225
Hotel Van	$60
Taxi	$40

1. Draw a tree diagram to illustrate the possible choices for the tourists. Determine the cost for each outcome.



2. If these six outcomes are chosen equally by tourists, what is the probability that a randomly selected tourist travel in a bus? 2/6 or 1/3

3. What is the probability that a person's trip cost less than $300? 4/6 or 2/3

4. What is the probability that a person's trip costs more than $350? 2/6 or 1/3

5. If the tourists were flying to New York, the subway would be a third way to get to the hotel. How would this change the number of outcomes? Use the Fundamental Counting Principle to explain your answer. It would add 1 more option.

$1 \cdot 3 + 2 \cdot 2 = 7$

A · S HV T + B HV T HV T

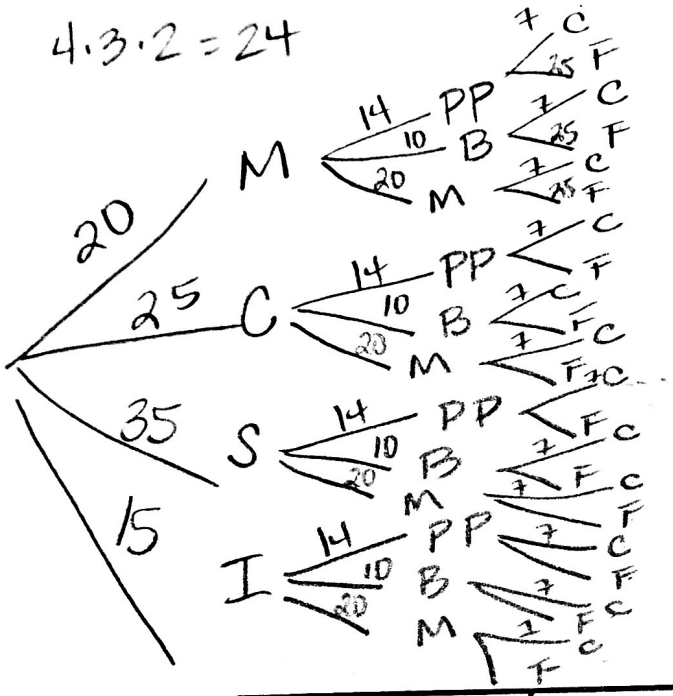
Name: _____ Date: _____

"Happy Birthday to You"

Andy has asked his girlfriend to make all the decisions for their date on her birthday. She will pick a restaurant and an activity for the date. Andy will choose a gift for her. The local restaurants include Mexican, Chinese, Seafood, and Italian. The activities she can choose from are Putt-Putt, bowling, and movies. Andy will buy her either candy or flowers.

1. How many outcomes are there for these three decisions? 24
2. Draw a tree diagram to illustrate the choices.

4·3·2 = 24



M P P C $41
M B C $37
M M C $47
M P P F $59
M B F $55
M M F $65
C P P C $46
C B C $42
C M C $52
C P P F $64
C B F $60
C M F $70

S P P C $56
S B C $52
S M C $62
S P P F $74
S B F $70
S M F $80
I P P C $36
I B C $32
I M C $42
I P P F $54
I B F $50
I M F $60

Dinner for Two	Activity Cost for Two	Gift Cost
Mexican - $20	Putt-Putt - $14	Flowers - $25
Chinese - $25	Bowling - $10	Candy - $7
Italian - $15	Movies - $20	

* Seafood $35

3. If all the possible outcomes are equally likely, what is the probability that the date will cost at least $50? 16/24 or 2/3
4. What is the maximum cost for the date? $80
5. What is the minimum cost for the date? $32
6. To the nearest dollar, what is the average cost for this date? $54.42
7. What is the probability that the date costs exactly $60? 2/24 or 1/12
8. What is the probability that the date costs under $40? 3/24 or 1/8

AFM Worksheet
1-1 FPC and Permutations

Name _____
Date _____ Period _____

For problems 1 and 2, you *must* draw boxes for each problem.

1. a) How many possible seven-digit phone numbers are there?

$10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 = 10^7$ or 10,000,000

b) How many seven-digit phone numbers are there that begin with the prefix 772?

$1 \cdot 1 \cdot 1 \quad 10 \cdot 10 \cdot 10 \cdot 10 = 10^4$ or 10,000

(7) (7) (2)

c) How many seven-digit phone numbers are there that begin with the prefix 772 and none of the last four digits repeat?

$1 \quad 1 \quad 1 \quad 10 \cdot 9 \cdot 8 \cdot 7 = 5040$

(7) (7) (2)

d) What is the **probability** that a randomly selected phone number with the prefix 772, has none of its last four digits repeating?

$$\frac{5040}{10{,}000}$$

2. Give the number of possible arrangements or selections for each situation.

a) Arrangements of six poetry books on a shelf

$6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 720$ $\quad {}_6P_6$

b) Arrangements of seven students seated in the front row of a classroom

$7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 5040$ $\quad {}_7P_7$

c) License plates with two letters followed by four digits.

$26 \cdot 26 \cdot 10 \cdot 10 \cdot 10 \cdot 10 = 6{,}760{,}000$

d) License plates with two letters followed by four digits, or four digits followed by two letters.

$26 \cdot 26 \cdot 10 \cdot 10 \cdot 10 \cdot 10 + 10 \cdot 10 \cdot 10 \cdot 10 \cdot 26 \cdot 26$

$= 13{,}520{,}000$

e) Outfits made up of a shirt, a pair of slacks, and a sweater, selected from five shirts, four pairs of slacks, and three sweaters.

$5 \cdot 4 \cdot 3 = 60$

* f) Restaurant meals formed by selecting an appetizer, a salad, a main course, and four choices of dessert. $1 \cdot 1 \cdot 1 \cdot 4$

g) Seven-digit telephone numbers, if the first digit cannot be zero.

$9 \quad 10 \quad 10 \quad 10 \quad 10 \quad 10 \quad 10$

3. In Ms. Scarpino's math class, there are six desks in each row. On the first day of the semester, she tells her students that they may sit anywhere they want, but that they must sit in the same row every day.

a) If the first row is completely filled, in how many different ways can the students who have chosen to sit there be seated?

$6! = 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 720$

b) What is the probability that the students in the front row will be seated in alphabetical order by their first name?

$\frac{1}{720}$

c) What is the probability that among the students in the front row, the tallest student will sit in the chair farthest to the right?

$\frac{1}{6}$

d) On April Fool's Day, the students came to class and found that two of the desks in the front row were missing. In how many ways could the students who usually sit in the front row choose the remaining desks?

$6 \cdot 5 \cdot 4 \cdot 3 = 360$

e) On April Fool's Day, what is the probability that Ricardo, one of the students who usually sits in the front row, was able to get a seat in this row?

$1/360$