Name:_____ Date:_____

AMDM Final Review Guide

UNIT 1: Number Applications

1) How many phone numbers are possible in the (770) area code if: For the form ABC-XXXX, A is restricted to 2-9 and B is restricted to 1-9. X and C can be any digit 0-9?

$8 \cdot 9 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 = 7{,}200{,}000$

A (2-9) B (1-9) C (0-9) X X X X

2) Write out one valid UPC code and one invalid UPC code. Show the math on both to prove they are valid or invalid

1 2 5 0 1 3 4 3 0 0 1 2

3+2+15+0+3+3+12+3+0+0+1+2 = 46

INVALID

1 2 5 0 1 3 4 3 0 0 1 6

3+2+15+0+3+3+12+3+0+0+1+6 = 50

VALID

3) You finished your class with the following: 90 test average, 84 on the final exam, 85 homework average, and 100 in participation. Calculate your final grade in the class using both grading systems:

Grading System 1:

Tests:	65%	90	= 58.5
Final Exam:	10%	84	= 8.4
Homework:	10%	85	= 8.5
Participation:	15%	106	= 15
			90.4

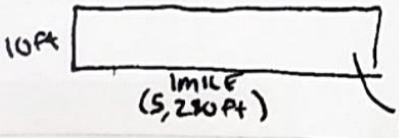
Grading System 2:

Tests:	70%	90	= 63
Final Exam:	20%	84	= 16.8
Homework:	5%	85	= 4.25
Participation:	5%	100	= 5
			89.05

4) A combination lock has 6 digits, none of which can repeat. How many different combinations are possible?

$10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 = 151{,}200$

5) You are standing among a crowd that is 10 feet deep and 1 mile long at a parade. You want to estimate how many people are there. If 30 people occupy 25 square feet (that is a 5 ft by 5 ft square), estimate the size of the crowd watching the parade along a 1 mile stretch (there are 5,280 feet in one mile)



$A = 10 \times 5{,}280 = 52{,}800 \text{ ft}^2$

$\frac{30 \text{ people}}{25 \text{ ft}^2} = \frac{x \text{ people}}{52{,}800 \text{ ft}^2}$ ← cross multiply!

$1{,}584{,}000 = 25x$

$x = 63{,}360$ people

UNIT 2: Probability

6) A study was conducted at Sparyberry about the number of people who participate in sports and those who participate in clubs. 170 were surveyed and 62 students participate in sports, 84 participates in clubs, 11 do both and the rest do neither

oops not a question

7) What is the probability that a person only participates in sports? (write you answer as a percent)

$\frac{62}{170} = .36$ 36%.

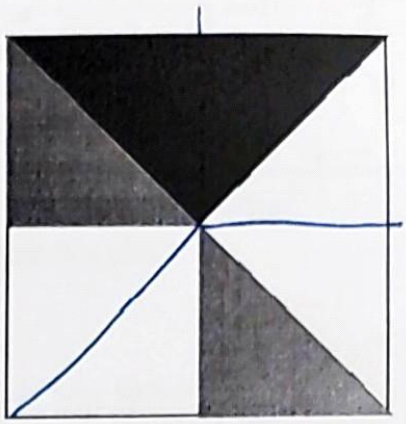
8) What is the probability that someone particpates in both sports and clubs? (write you answer as a percent)

$\frac{11}{170} = .06$ 6%.

9) What is the probability that the student is not in sports or clubs (write you answer as a percent)

$\frac{13}{170} = .08 = 8\%$

Use the diagram to answer the following questions



10) If a penny is dropped on the mat, what is the probability of the following:

Gray: $\frac{2}{8} = 25\%$

White: $\frac{4}{8} = 50\%$

Black: $\frac{2}{8} = 25\%$.

11) If a penny is dropped and it lands on black the player earns $5, if a penny is dropped and it lands on gray the player earns $6 and if lands on white the player earns nothing. It costs $3.00 to play the game. How much would the people who RUN the game expect in PROFIT per play?

$5(\frac{2}{8}) + 6(\frac{2}{8}) + 0(\frac{4}{8}) = 2.75$ $\quad 3 - 2.75 = \$.25$ profit

12) If the people who run the game want to earn at least $125 in profit, how many people should they expect to play the game?

$125 = .25x$ $\quad 500$ people

UNIT 3: Statistics

Define the following terms and give an example of each:

13) Treatment

IN AN EXPERIMENTAL STUDY, IT IS WHAT IS ADMINISTERED TO SUBJECTS TO LOOK FOR A CHANGE. STUDY: "DOES LISTENING TO MUSIC WHILE TESTING IMPROVE Variable of interest TEST SCORES?" TREATMENT = MUSIC

THE VARIABLE THAT THE RESEARCHER IS LOOKING FOR A CHANGE IN. FOR THE ABOVE STUDY IT WOULD BE THE TEST SCORES.

Observational study/Experimental study

OBSERVATIONAL STUDY: A STUDY IN WHICH NO TREATMENT OCCURS AND SUBJECTS ARE MONITORED OR ASKED QUESTIONS ABOUT THE TOPIC. EXAMPLE: A SURVEY ON THE EFFECTS OF WORKING AFTER SCHOOL AND GPA

EXPERIMENTAL: A STUDY WITH 2 OR MORE GROUPS WHERE A TREATMENT IS ADMINISTERED TO LOOK FOR A CHANGE. EXAMPLE: ONE GROUP GETS A COOKIE BEFORE A TEST AND ANOTHER GROUP DOES NOT THEN WE LOOK AT THEIR TEST SCORES AND COMPARE

) Open Question:

A QUESTION WHERE THE SUBJECT CAN ANSWER IN ANY WAY

"WHAT ARE YOUR OPINIONS ON THE SCHOOL DRESS CODE?"

) Closed Question:

A QUESTION WHERE ANSWER CHOICES ARE PROVIDED:

"ON A SCALE OF 0-10 WITH 10 BEING THE HIGHEST. HOW WOULD YOU RATE THE CUSTOMER SERVICE AT CHICK-FIL-A?"

NULL hypothesis:

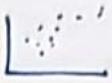
THE HYPOTHESIS ABOUT THE TOPIC THAT IS THE CURRENTLY HELD BELIEF.

H_0: GETTING 8 HOURS OF SLEEP EACH NIGHT IMPROVES GRADES

19) ALTERNATIVE HYPOTHESIS:
THE HYPOTHESIS THAT GOES AGAINST THE NULL HYPOTHESIS

H_a: GETTING 8 HOURS OF SLEEP EACH NIGHT DOES NOT IMPROVE GRADE?

20) Scatter Plot:

COMPARES 2 VARIABLES TO SEE TRENDS 

21) Pie Chart

COMPARES 1 VARIABLE WITH PERCENTAGES  

22) Bar Graph
SHOWS THE FREQUENCY OF 1 VARIABLE. A DOUBLE BAR GRAPH IS STILL 1 VARIABLE BUT 2 CATEGORIES (LIKE FEMALE/MALE)

23) What are the 5 types of sample, define and give an example of each

SIMPLE RANDOM: EACH MEMBER OF A POPULATION HAS AN EQUAL CHANCE OF BEING SELECTED. EX: TO GET 10 EVERY STUDENT IS AND USING A RANDOM # GENERATOR TO SELECT SUBJECTS

STRATIFIED RANDOM: SAME AS SIMPLE RANDOM BUT THE POPULATION IS SPLIT INTO GROUPS FIRST. EX: SPLITTING STUDENTS UP INTO GRADE LEVEL FIRST THEN SELECTING MEMBERS OF EACH CLASS

SYSTEMATIC: A RULE IS USED TO SELECT SUBJECTS. EX: SELECT EVERY 3RD PERSON IN THE LUNCH LINE

CLUSTER: A MINI POPULATION IS IDENTIFIED AND EVERYONE IS SAMPLED. EXAMPLE: EVERYONE IN D LUNCH

CONVENIENCE: ONLY MEMBERS OF THE POPULATION WHO ARE EASILY ACCESIBLE ARE SELECTED. EXAMPLE: ONLY SELECTING FRIENDS OR PEOPLE IN YOUR CLASSES

UNIT 6: Finance

24) Jacob just received a settlement from court case in which he received $3,400. He decided to put this in a savings account which earned him .07% compounded quarterly. How much money will he have at the end of 6 years? N = 6·4 = 24 FV = ?
I = .07 PY: 4
PV: -3400 CY: 4
PMT = 0

$3414.31

25) Pauline is 16 years old and is saving up for a down payment on a car when she turns 18. The down payment of the car is 10% of the cost of the car. The car she wants retails at $26,700. If she is going to put her money into a savings account that accumulates 3.2% compounded monthly how much does she need to put into savings now?

N: 2·12 = 24
I = 3.2
PV ?
PMT 0
FV: 2670
PY: 12
CY: 12

26,700(.10) = 2670
Down payment

$2504.69

Kiki has racked up [illegible] of credit card debt over numerous credit cards. Below are [illegible] edit cards with her current balances and rates.

241.29 **Visa: $4,750 at 19.8% APR**
488.43 **MasterCard: $9,927 at 16.5% APR**
58.41 **BP Gas Card: $1,119 at 22.65% APR**
179.70 **Kohl's Credit Card: $3,445 at 21.99% APR**

N= 24
I =
PV =
PMT = ?
FV = 0
P/Y C/Y = 12

26) She wants to pay off all of her debt in 2 years. What would the minimum payment be for each credit card? $241.29 $488.43 $58.41 $178.70 $

27) So how much would she be paying total for all 4 credit cards each month?

ADD TOGETHER $966.83 TOTAL

28) She makes $3,000 gross monthly income as an assistant manager. Her monthly taxes are 15% in income tax, 1.45% in medicare, 6.2% in social security and 7% in state income tax

a) What is her after-tax monthly income?

15 + 1.45 + 6.2 + 7 = 29.65%

3000(.2965) = 889.5

3000 − 889.5 = $2110.50

b) If her monthly bills + utilities come to a total of $1120 per month, what does that leave left over for food and other expenses?

2110.50
− 1120 (UTILITIES)
− 966.83 (CREDIT CARD BILLS)
= $23.67

← YIKES! KIKI NEEDS TO MAKE SOME SERIOUS ADJUSTMENTS

29 You are buying a new car for $55,000. You are taking out a five year loan from the bank with an interest rate of 3.9%

AND 7% DOWN PAYMENT → 55,000(.07) = 3850 (DOWN PAYMENT)

a. What is the monthly price of the car

$939.70

N = 60
I = 3.9
PV = 55,000 − 3850 = 51,150
PMT = ?
FV = 0
P/Y C/Y = 12

b. What is the total cost of the car?

939.70 × 60 + 3850 = $60,232

(939.70 × 60: EVERY MONTHLY PAYMENT; + 3850: ACTUAL DOWN PAYMENT)

30 Lance is in credit card debt. He currently owes 8,564 on his Visa. He has decided that he is not going to make any more purchases.

a. If he wants to be out of debt in 2 years how much would he need to make in monthly payments? His APR is 26.99%.

N = 24
I = 26.99
PV = 8564
PMT = ?
FV = 0 P/Y C/Y = 12

$465.67

t

to

99%.

b. The credit card company only requires him to make a minimum payment of $200 every month. If he only makes the minimum payment how many years would it take him to pay off the credit card?

N=?
I=26.99
PV=8564
PMT=-200
FV=0 P/Y=12

N=148 MONTHS = 12 YEARS

31) Heidi just took out a student loan for $23,560. She is using a subsided government loan which is a 4.99% interest compounded monthly and has a 10 year pay back limit. N=120

a. How much will her monthly payments be?

$249.78

I=4.99
PV=23,560
PMT=?
FV=0
P/Y=0

b. If she chose to pay back $350 each month instead how long would it take her to pay it off? How much time does she save?

N=79 MONTHS = 6.6 YEARS

N=X?
I=4.99
PV=23,560
PMT=-350

UNIT 4/5: Formulas/Regression

There is a new restaurant (**Buffet Palace**) that charges based on the amount of food that you consume. The following breakdown is how the restaurant charges. Note that you are charged a one-time $2.50 plate fee

Pounds of Food	Price per Pound
Up to 5 pounds	$15 per pound
Greater than 5 pounds but less than 10 pounds	$6 per pound
Greater than 10 pounds	$4 per pound

32) How much would you be charged if you ate 3 pounds of food?

2.50 + 15(3) = $47.50

33) How much would you be charged if you at 8 pounds of food?

2.50 + 5(15) + 3(6) = $95.5

34) How much would it cost for your brother (the bottomless pit) who ate 19 pounds of food?

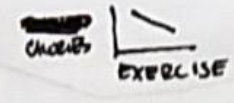
2.50 + 5(15) + 5(6) + 9(4) = $143.50

35) Determine if the following are correlations or causations and then determine if they would be positive or negative

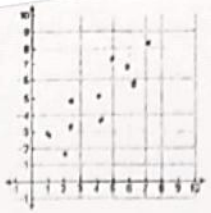
a. There is a strong connection that in many marriages, the older the husband is the older the wife is CORRELATION. PEOPLE TEND TO MARRY SOMEONE CLOSE TO THEIR AGE. EX. OLDER PEOPLE TEND TO MARRY OLDER PEOPLE BUT A HUSBANDS AGE DOES NOT CAUSE THE WIFES AGE. POSITIVE

b. The number of hours of exercise you complete each week and the amount of calories burned. CAUSATION. EXERCISE DIRECTLY AFFECTS CALORIES BEING BURNED. NEGATIVE

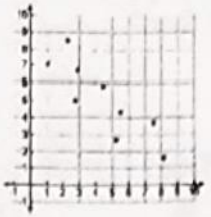
NEGATIVE



an example of the following types of regression:



Linear/Positive/Weak



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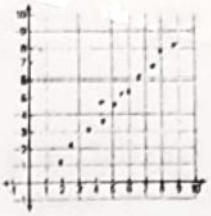
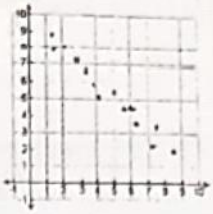


Linear/Positive/Strong



Linear/Negative/Strong

37) Classify the type of strength and direction of each of the correlation coefficients.

r = 0.9994 STRONG POSITIVE

r = 0.7442 WEAK POSITIVE

r = -0.9987 STRONG NEGATIVE

r = -0.3332 NO CORRELATION

r = -.7992 WEAK NEGATIVE

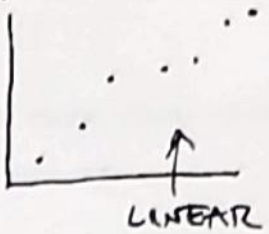
The following data has been collected regarding hours studied and grades on a Final Exam:

Hours	1		2	3	4	5	6	7
Grade	61		68	77	82	85	90	94

38) Which regression model best represents the data linear or exponential? Why?

LINEAR = $r = .986$ ← LINEAR HAS THE BETTER CORRELATION COEFFICIENT

EXPONENTIAL $r = .975$



39) What is the correlation coefficient?

$r = .986$

40) What is the regression model? (equation)

$y = 5.39x + 58$

41) What equation would you expect someone to get if they studied for 9 hours?

$y = 5.39(9) + 58$

106.51% ← WHAT!? THERE BETTER BE EXTRA CREDIT

42) Approximately many hours would someone need to study if they would like to make a 100?

$100 = 5.39x + 58$ $x = 7.8$ HOURS