Advanced Mathematical Decision Making Name_____

2015 Spring Semester Review (1)

Unit 1: Analyzing Numerical Data

0 1 2 3 4 5 6 7 8 9

1. How many phone numbers are possible in the (512) area code if:
   For the form ABC-XXXX, A and B are restricted to 3-9 but C and X can be any digit 0-9
   $\frac{7}{A}\ \frac{7}{B}\ \frac{10}{C} - \frac{10}{X}\ \frac{10}{X}\ \frac{10}{X}\ \frac{10}{X}$
   4,900,000

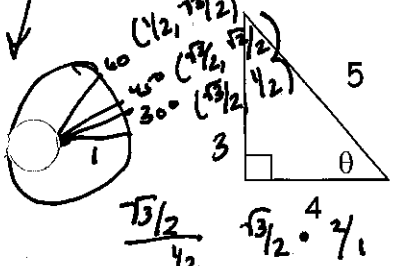
2. You are standing amongst a crowd that is 3 feet deep and 2 miles long at a parade. You want to estimate how many people are there. If each person occupies 1.5 square feet, estimate the size of the crowd watching the parade along a 2-mile stretch (Both sides of the street) (there are 5,280 feet in one mile)
   $6(2)(5,280) = 63,360/1.5 = 42,240$

3. Which of the following is a valid UPC code?
   a) 1-00982-34983-7 b) 0-28400-07132-1 c) 0-25700-00391-4 d) 7-54246-10478-3

4. Mr. Smith uses the following average for grading his Pre-Cal classes: Tests are 45% of the grade, quizzes count 25%, homework is 15%, and the final exam is 15%. Tom has a quiz average of 80, a homework average of 90, and a test average of 86. What does Tom need to make on the final to get an 85 in the class? Assume that the highest he can make on the test is 100.
   $80(.25) + 90(.15) + 86(.45) + .15x = 85$
   $20 + 13.5 + 38.7 + .15x = 85$
   $72.2 + .15x = 85$
   $.15x = 12.8$
   $x = 85.3$

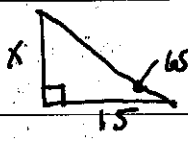
Unit 2a: Intro to Trig

1. Find one positive and one negative coterminal angle to $\theta = 120°$ 120, 120, +360, 480°, −360, −240°
2. Find the sin, cos, and tan for 60° $\sin 60 = \sqrt{3}/2$ $\tan 60 = \sqrt{3}$
3. Find the value of all six trig functions: $\cos 60 = 1/2$



$\sin\theta =$ 3/5	$\csc\theta =$ 5/3
$\cos\theta =$ 4/5	$\sec\theta =$ 5/4
$\tan\theta =$ 3/4	$\cot\theta =$ 4/3

4. A tree casts a shadow that is 15 feet long. The angle of elevation to the top of the tree is 65°. How tall is the tree? Draw a picture of the situation, set up an equation and solve.



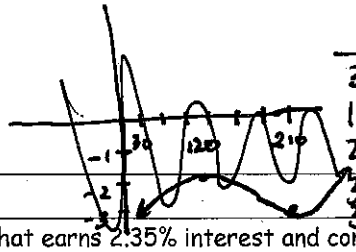
$\tan 65 = \frac{x}{15}$ $x = 32.2$ ft

Unit 2b: Graphing Trig Functions

1. For the following equation find the amplitude, period, horizontal shift, and vertical shift:
   $g(x) = 2\cos 3(x + 60°) + 5$
   amp = |2| = 2 period = 360/b = 360/3 = 120
   HS = x + 60 = 0, x = −60 vertical shift = 5

2. Graph $y = \sin(x - 30°) - 3$

3. Graph $y = 3\cos 2(x + 90°) - 1$



x	y	
30	−3	SA
120	−2	
210	−3	SA
300	−4	
340	−3	SA

* Start: x − 10 = 0, x = 30 End = 360 Increments = 360/4 = 90 Period/4
Period 360/1 = 360

Unit 4a-c: Finance

1. Sam is investing $500 in a savings account that earns 2.35% interest and compounds annually. Write a function that models Samantha's investment. $A = 500(1 + .0235/1)^t$ $A = 500(1.0235)^t$

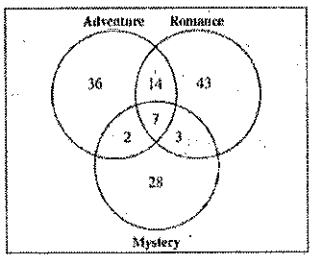
2. You invest $5,000 in an account earning 4% interest compounded quarterly. How much will you have in 5 years?
   6,100.95

3. Mary got $2,000 for graduation. She plans to invest this in a savings account that earns 3.2% compounded monthly. How long will it take for that investment to be worth $50,000?
   1,128.69 = 100.7 years

Unit 3: Probability

1. The Venn Diagram below shows the types of novels read by members of the lit club over the summer break.

LITERATURE CLUB SUMMER READING



=133

What is the probability that a student reads a romance novel? $67/133$

What is the probability that a student reads a romance and an adventure novel? $24/133$

What is the probability that a student reads a mystery or an adventure novel? $59/133 + 40/133 - 9/133 = 90/133$

2. Stephanie plays chess. Next week she will be competing in a tournament in which she will play 5 games. To win a trophy, she must win at least 4 games. What is the probability that she will win a trophy? on back

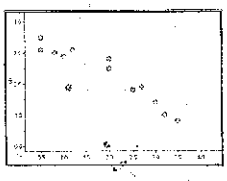
3. You are eating lunch at Subway and have narrowed your sandwich choices to the items in the table below. Find P(white bread,turkey,ranch)?

$(.6)(.5)(.3) = .09$ or 9%

Bread	Meat	Spread
Honey Oat (0.4)	Ham (0.5)	Mayo (0.5)
White (0.6)	Turkey (0.5)	Mustard (0.2)
		Ranch (0.3)

Unit 5: Function Models

1. For the scatter plot, tell whether the data have a strong positive, strong negative, weak positive, or weak negative correlation



2. Bill is working at a tv store. He gets 30 dollars a day and 15 dollars for every tv he sells. Write a recursive formula for this situation. $y = 15x + 30$

3. What type of function would be the best fit for the following data? Find the model equation and the r-value.

L1	L2
1	2
2	5
3	10
4	18
5	32
6	63

Linear = $r = .9183$

Exp = $r = .9966$

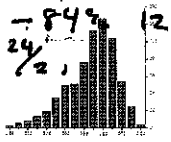
4. Letter grades are assigned as follows: 0-69 F, 70-73 D, 74-79 C, 80-89 B, 90-100 A. What type of function does this describe? Step

Unit 6: Statistics

1. Researchers are often concerned that participants in a study show improvement simply because they are in a study and not because they are receiving an effective treatment. What is this called? Placebo effect
2. The school newspaper decided to conduct a survey on the cafeteria. They poll students as they come to lunch about what food line they like the best. This is an example of what type of sampling? Random Convenience
3. A survey was done to find out how many kids like the Atlanta Braves. The surveyors estimated that between 60 and 84% of people like the Braves. What is the margin of error? $60 - 84\%$, $24/2$, 12%

$MoE = \pm \frac{1}{\sqrt{n}}$

4. Is the following distribution symmetrical, skewed left, or skewed right?



Skewed left

5. Find the 5 number summary for Anne's grades. 75 82 97 78 93 85 86 94 80 71

71, 78, 83.5, 93, 97