

Pre-Calculus 12 Special Assignment 5

Name: _____ Block: _____

Assignment mark: ____/____
Assignment quiz mark: ____/____
Average of two marks: ____%

This assignment is due on **January 8, 2014**.

Goals:

- 1) To practice the art of communicating a written solution to a math problem. You must clearly present the key concepts and the logical sequence of steps taken to arrive at a solution. Just answers are not good enough! Illustrations of solutions by graphing or drawing diagrams are often part of your presentation.
- 2) To encourage the use of the math textbook as a resource for you to learn from and get explanations of concepts and sample solutions.
- 3) To encourage a dialog between students of concepts and processes to achieve solutions to mathematical problems.

Format requirements:

This assignment will be graded so you must show at least one (most of these questions require many more than one) step of work for each question. If I cannot see clearly what you have done I cannot give you the marks. There is only one accepted format for this and all future assignments.

- 1) You will choose **3 of the 5** given questions to complete. (It is still to your advantage, however, to know how all of them are done.) All questions are worth the same number of marks. The questions must be in the same order that they are presented to you. If you do more than 3 questions, only the first 3 will be marked.
- 2) Each step
for each question
must be
on the next line
down, not to the right.
- 3) Students are encouraged to help each other with understanding the assignments but must submit their own work.
- 4) Any explanations must be done in complete sentences with proper mathematical notation as necessary.

Marks will be deducted if these requirements are not met. Students will be penalized 20% per day when assignments are turned in late and be worth 0 (zero) on the day they are handed back to the students.

Copied assignments will not be marked.

Questions:

1. Give the solution to $3\csc^3 x + 8 = 6\csc^2 x + 4\csc x$
 - a) for $0 \leq x < 2\pi$
 - b) for $x \in \mathbb{R}$
2. Find the exact value of each using (i) a sum or difference identity and (ii) a double angle identity and verify that each method gives the same value. You must work in the unit given (radians or degrees) for each question.
 - a) $\cos\left(\frac{\pi}{8}\right)$
 - b) $\cos(75^\circ)$
 - c) $\sin\left(\frac{13\pi}{12}\right)$
3. A restaurant has the following options:
 - w different choices of beverage
 - x different choices of appetizer
 - y different choices of entrée: c have meat; the others are vegetarian
 - z different choices of dessert: d have fruit; the others do not

A meal consists of a beverage and an entrée. An appetizer is optional; a dessert is optional. Determine expressions for each of the following.

 - a) How many meals are possible?
 - b) How many meals are possible with a vegetarian entrée?
 - c) How many meals are possible without an appetizer?
 - d) How many meals are possible with a meat entrée and a fruit dessert?
 - e) How many meals are possible with an appetizer but no dessert?
4. Given the function $f(x) = {}_{x+1}P_2 - {}_xP_1$:
 - a) State the domain of $f(x)$.
 - b) Simplify $f(x)$ to a single term.
 - c) Sketch the graph of $f(x)$.
5. The name of a particular James Bond villain was “Francisco Scaramanga.”
 - a) Determine the number of permutations of the letters in his name.
 - b) Determine the number of permutations of the letters in his name if:
 - i) you must begin with a consonant.
 - ii) you must begin with a vowel.

Leave your answers in scientific notation if necessary.