Suffolk County Community College

Michael J. Grant Campus

Department of Mathematics

Wednesday, May 11, 2022

MAT 125
Pre-Calculus II

Final Exam

Instructor:

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Please print the requested information in the spaces provided:

Student:

Name: _____

Student Id: _____

Email: *include to receive the final grade via email* ONLY *if you are not getting email updates* _____

- *Notes and books are permitted on this exam.*
- *Graphing calculators, smartwatches, computers, cell phones and any other communication-capable devices are prohibited. Their mere presence in the open (even without use) is a sufficient reason for an immediate dismissal from this exam with a failing grade.*
- *You will not receive full credit if there is no work shown, even if you have the right answer. Please don't attach additional pieces of paper: if you run out of space, please ask for another blank final.*

Problem 1. Consider the expression $\arccos\Big(\cos(-4)\Big)$.

(1). Draw -4, $\cos(-4)$ and $\arccos\Big(\cos(-4)\Big)$ in the same picture with the unit circle, showing how they are interconnected.

Space for your solution:

(2). Use the above picture to express $\arccos\Big(\cos(-4)\Big)$ without any trigonometric functions.

Space for your solution:

Problem 2. Solve the equation $\cos(2\theta) = 1 + \sin\theta$.

Space for your solution:

Problem 3. Solve the equation $\cot(t) = \sin(t)$.

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Problem 4. In this problem, we will study $\cos\big(\arctan(y)\big)$.

(1). Suppose $\theta \in [0, \pi]$ and $\tan(\theta) = -2$. Draw -2, θ and $\cos(\theta)$ in the unit circle.

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(2). Using the above picture, find $\cos(\theta)$.

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(3). Find $\cos\big(\arctan(-2)\big)$. More specifically, find an expression of this quantity that does not use any trigonometric functions. Can the work done for the previous sub-problem be used? To what extent?

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(4). For an arbitrary real number y, find $\cos\big(\arctan(y)\big)$. More specifically, find an expression of this quantity that does not use any trigonometric functions.

Space for your solution: