**Practice Question 4: Symbolic Manipulations**

**Directions:**

* Unless otherwise specified, the domain of a function is assumed to be the set of all real numbers for which is a real number. Angle measures for trigonometric functions are assumed to be in radians.
* Solutions to equations must be real numbers. Determine the exact value of any expression that can be obtained without a calculator. For example, **,** , and can be evaluated without a calculator.
* Unless otherwise specified, combine terms using algebraic methods and rules for exponents and logarithms, where applicable. For example, , , , and should be rewritten in equivalent forms.
* For each part of the question, show the work that leads to your answers.

|  |  |  |
| --- | --- | --- |
| (A) | The functions and are given by | |
| (i) | Rewrite as a single expression including only one trigonometric function. |
| (ii) | Rewrite as a constant multiple of . |
| (B) | The functions and are given by | |
| (i) | Solve for values of in the domain of . |
| (ii) | Solve for values of in the domain of . |
| (C) | The function is given by  Find all values in the domain of that yield an output of 12. | |