Name: _____

1. (1 pt.)
   - **Read all material carefully.**
   - *If in doubt whether something is allowed, ask, don't assume.*
   - You may refer to your books, papers, and notes during this test.
   - E-books may be used *subject to the restrictions* noted in class.
   - Computers are not permitted, except when used strictly as e-books or for viewing ones own notes.
   - Network access of any kind (cell, voice, text, data, ...) is not permitted.
   - Write, and draw, carefully. Ambiguous or cryptic answers receive zero credit.
   - Use class and textbook conventions for notation, algorithmic options, etc.
   - **Do not attach or remove any pages.**

   Write your name in the space provided above.

   Do not write on this page below this point.

WAIT UNTIL INSTRUCTED TO CONTINUE TO REMAINING QUESTIONS.

Do not write on this page.
(It is for use in grading only.)

Q	Full	Score
1	1	
2	2	
3	2	
4	2	
5	2	
6	2	
7	2	
8	17	
9	15	
total	45	

2. (2 pts.) Provide a single C++ statement that prints, to *standard output*, the **number of elements** (items) in a C++ STL *vector* named `someVec`, whose elements are of type `float`.

3. (2 pts.) Provide a single C++ statement that prints, to *standard output*, the **number of bytes** used by C++ STL *vector* named `someVec`, whose elements are of type `float`.

4. (2 pts.) Provide a single C++ statement that prints, to *standard output*, the **number of elements** (items) in an array named `someArr`, whose elements are of type `float`.

5. (2 pts.) Provide a single C++ statement that prints, to *standard output*, the **number of bytes** used by an array named `someArr`, whose elements are of type `float`.

6. (2 pts.) Provide a single C++ statement that defines an *array*, named `aNums`, of five unsigned integers and initializes it to contain the elements (in index order): 3, 1, 4, 1, 5.

7. (2 pts.) Provide a single C++ statement that defines a C++ STL *vector*, named `vNums`, of three unsigned integers and initializes it to contain the elements (in index order): 2, 3, 5.

8. (17 pts.) Provide **well-formatted source code of a complete C++ program** that

   (a) Defines the array `aNums` as in Question 6.

   (b) Defines the vector `vNums` as in Question 7.

   (c) Prints the elements of `aNums` on *standard output* on a single newline-terminated line, with a single space after each element.

   (d) Prints the elements of `vNums` as above.

   (e) Swaps second element (that is, the element at index 1) of `aNums` with the second element of `vNums` (so that the new second element of `aNums` is the old second element of `vNums`, and vice versa).

   (f) Extends `vNums` to contain five numbers (instead of the original three), with the two new elements, in index order, being the corresponding elements of `aNums`.

   (g) Prints the (current) elements of `aNums` as done earlier.

   (h) Prints the (current) elements of `vNums` as done earlier.

   Poorly formatted, messy, or otherwise hard to read code will result in very substantial loss of points. *Explain your answer briefly, especially for better partial credit.*

[additional space for earlier material]

9. (15 pts.) Provide **well-formatted source code of a complete C++ program** that

   (a) Defines a function `vec_zero_some` that sets *some specified* elements of a given vector of `int`s to zero. The elements to be set to zero are specified by an array of `int`s, whose elements are the *indices* of the vector that are to be set to zero. In more detail, the function takes three arguments, `vec`, `arr`, and n that are, respectively, the vector of `int`s that is to be modified, the array of indices of `vec` (that are to be zeroed), and the number of elements in `arr`. Invoking (executing) the function should result in all elements of `vec` that are at an index position that occurs in `arr` being set to zero.

   (b) Demonstrates the operation of this function using a suitably defined vector and array, both of whose elements are printed before and after the function is invoked.

   Poorly formatted, messy, or otherwise hard to read code will result in very substantial loss of points. *Explain your answer briefly, especially for better partial credit.*