

Name: \_\_\_\_\_

Test #1  
Bruce Bolden

CS 112  
September 26, 1997

Answer questions as indicated. Closed book/Closed Notes. NO calculators.

## 1 Basic Concepts—20 points

Circle the correct answer. Each problem in this section is worth 2 points.

## 2 Arithmetic Operations—20 points

Fill in the blank. Each problem in this section is worth 4 points. What is the value of  $k$  in the following statements using integer arithmetic.

Problem 1.  $k = 3 + 9 \% 5 - 6$  \_\_\_\_\_

Problem 2.  $k = 7 / 6 + 7 \% 6$  \_\_\_\_\_

Problem 3.  $k = (7 / 6) * (9 \% 7)$  \_\_\_\_\_

Problem 4.  $k = (11 + 6) < (7 * 3)$  \_\_\_\_\_

Problem 5.  $k = ('5' - '1') + ('7' - '2')$  \_\_\_\_\_

## 3 Program Statements—10 points

In problems 16–20, show all additional variable names and types that you choose to use.

Problem 6. Write a statement that will convert  $x$  pounds to  $y$  grams (recall: 454 g = 1 lb). \_\_\_\_\_

Problem 7. Write two statements for calculating the circumference of a circle, given the radius (recall  $A = \pi r^2$  and  $\pi = 3.14$ ).  
\_\_\_\_\_  
\_\_\_\_\_

Problem 8. Write a statement that will convert  $n$  inches to  $f$  feet (recall: 1 ft = 12 in). \_\_\_\_\_

Problem 9. Write a statement that can be used to calculate the volume of a sphere, given the radius  $V = \frac{4}{3}\pi r^3$ . \_\_\_\_\_

Problem 10. Write a statement that can be used to calculate the volume of a cylinder  $V = \pi r^2 h$ . \_\_\_\_\_

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## 4 Program Analysis—20 points

Fill in the blanks. Two points each. Problem 22 refers back to problem 21.

Problem 11. `double x = 5;` declares that `x` is a \_\_\_\_\_ variable.

Problem 12. `cout << "k: " << x*5;` will write: \_\_\_\_\_.

Problem 13. `char ch = '3';` declares that `ch` is a \_\_\_\_\_ variable.

Problem 14. `long b = 3;` declares that `b` is a \_\_\_\_\_ variable.

Problem 15. `long m; m = 3.1*4;`  
`cout << "m: " << m;` will write: \_\_\_\_\_.

Problem 16. There are at least **five** errors in the program below. **Circle five** and only five of them. Each error is worth two points.

```
// test1.cpp
#include <iostream.h>

main()
{
    integer j, k;
    double x, y;

    cout << "Enter two numbers: "
    cin >> x, y;
    cout << x << y;
    / /read values
    cout << "Enter two more numbers: ";
    cin >> k, j;
    double a = x + y;
    double b = k * j;
    if( a => b )
        cout << "product is less than sum" << endl;
    else
        cout << "product is greater than sum";
    return 0;
}
```

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## 5 Programs—30 points

Problem 17 (**10 points**). Write a program that converts a line of data containing three integers so that the data appears on three separate lines.

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Problem 18 (**20 points**). Write a *complete* program that reads three numbers, adds 3.14 to each of them, and writes the result to the standard output stream if the result is greater than 10.

**Bonus Problem:** Two points. Character arithmetic: What value does `i` have after executing this statement `i = '8' - '4';`