

Instructions: Work this problem by hand with no notes and no computer within two hours. Once you are finished, compare your solution to the answers provided and calculate your score. Simply studying the solution will not realistic measure of how well you will perform on the test.

Note: This is just a sample, so the actual test may test other concepts not necessarily included in the problems below. This test shows the approximate level of detail to be expected in test problems.

Sample Test #2

1. (15 points) Determine the output of the following program.

```
//Sample Test #2 - Problem 1
#include <iostream>
using namespace std;
int main()
{
    int j, k, m;
    int Total1 =0, Total2 =0, Total3 =0, Total4 =0, Total5 =0;
    for (j = -7; j <= 7; j++)
        Total1 ++;
    for (j = 11; j > -11; j-=3)
        Total2 += 2;
    for (j = 1; j <= 100; j*=3)
        Total3 += j;
    for (k = 1; k <= 5; k++)
        for (j = 1; j <= k; j++)
            Total4++;
    for (k = 1; k <= 8; k+=2)
        for (j = 9; j > 0; j-=2)
            for (m = 4; m <= 12; m+=4)
                Total5++;
    cout << "\nTotal1 = " << Total1 << "\tTotal2 = " << Total2
         << "\nTotal3 = " << Total3 << "\tTotal4 = " << Total4
         << "\nTotal5 = " << Total5 << endl;
    return 0; }

```

Problem 1 Output:

Total1 = _____

Total2 = _____

Total3 = _____

Total4 = _____

Total5 = _____

2. (18 points) Determine the output of the following program.

```
// Sample Test #2 - Problem 2
#include <iostream>
using namespace std;
int main()
{
    int A = 1, B = 40, C = 3, D = 99, E = 1, F = 30;
    while (A < B)
    {
        A+=2;
        B-=3;
    }
    cout << "A = " << A << endl << "B = " << B << endl;
    do
    {
        C*= 2;
        D/=3;
    }
    while (C < D);
    cout << "C = " << C << endl << "D = " << D << endl;
    for(int G = 1; G<10; G++)
    {
        E++;
        if(E-F >= G) break;
        F--;
    }
    cout << "E = " << E << endl << "F = " << F << endl;
    return 0;
}
```

Problem 2 Output:

A = _____

B = _____

C = _____

D = _____

E = _____

F = _____

3. (8 points) Determine the output of the following program.

```
// Sample Test #2 - Problem 3
#include <iostream>
using namespace std;
int main()
{
    char j;
    int k = 1;
    for (j=65; j<= 90; j+=2)
    {
        cout << j << " ";
        if (k%5 == 0) cout << endl;
        k++;
    }
}
```

Problem 3 Output:

4. (8 points) Determine the output of the following program

```
// Sample Test #2 - Problem 4
#include <iostream>
using namespace std;
int main()
{
    int A = 1, B = 10;
    while (A%B)
    {
        for(int j=A; j<B; j++)
            cout << A << " ";
        A++;
        cout << endl;
    }
}
```

Problem 4 Output:

5. (18 points) Determine the output of the following program.

```
// Sample Test #2 - Problem 5
#include <iostream>
using namespace std;
int F1(int, int); //function declaration or prototype for F1
int F2(int, int);
int main()
{
    int A = 4, B = 19, C = 11, D = 7, E, F, G, H, I, J;
    E = F1(A,C);
    F = F1(B,D);
    G = F1(F1(A,B),F1(C,D));
    cout << "E = " << E << endl;
    cout << "F = " << F << endl;
    cout << "G = " << G << endl;
    H = F2(A,D);
    I = F2(-A,B);
    J = F2(F2(A-B,A+C),F2(A-D,D+B));
    cout << "H = " << H << endl;
    cout << "I = " << I << endl;
    cout << "J = " << J << endl;
    return 0;
}
int F1(int N, int M) // start of function definition for F1
{
    int Sum = 0;
    if(M>N) return M%N;
    else return N%M;
} // end of function definition for F1
int F2(int A, int B)
{
    int N = 0;
    if (A<B)
        for (int j = A; j <=B; j++) N++;
    else
        for (int j = B; j <=A; j++) N++;
    return N;
}
```

Problem 1 Output:

E = _____

F = _____

G = _____

H = _____

I = _____

J = _____

6. (6 points) Write the prototype (or function declaration) for each function described below.

- A) Write the prototype for a function that has returns the number of significant digits in a number. For example, if the input is 35.125, the output will be 5.

Prototype: _____

- B) Write the prototype for a function that returns the product and sum of two numbers (all doubles)

Prototype: _____

- C) Write the prototype for a function that displays a character N times. For example, if the character is 'H' and N = 6, the function will display the following:

HHHHHH

Prototype: _____

(What's a *prototype or function declaration*? Comments in the problem 5 program for an example.)

7. (12 points) Determine the output of the following program. Be careful!

<pre>// Sample Test #2 - Problem 7 #include <iostream> #include <cmath> using namespace std; void F1(int,int,int,int&); void F2(int,int&,int&,int&); int main (void) { int E=1,F=2,G=3,H=4,W=5,X=6; F1(E,F,G,H); F2(E,F,G,H); cout << "E = " << E << "\nF = " << F << endl; cout << "G = " << G << "\nH = " << H << endl; cout << "W = " << W << "\nX = " << X << endl; return 0; } void F1(int E,int F,int G,int& H) { E=4; F=3; G+=E; H+=F; } void F2(int W,int& X,int& Y,int& Z) { W=8; X=7; Y+=W; Z+=X; }</pre>	<p>E = _____</p> <p>F = _____</p> <p>G = _____</p> <p>H = _____</p> <p>W = _____</p> <p>X = _____</p>
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8. (15 points) Write a C++ program as described below:

Write a function that has one input and two outputs described as follows:

- Input: a distance in inches
- Output: a distance in feet and inches
- Assume that all inputs and outputs are integers
- The function simply performs the calculations. cin and cout should not be used.

Also write a main program as described below:

- Prompt the user to enter a distance in inches
- Call the function to convert the distance from inches to feet and inches
- Display the result.
- Note: All cin and cout statements should be in main, not in the function.

Example:

Input prompt and input value: Please enter a distance in inches: 32

Outputs: 32 inches = 2 feet and 8 inches