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Checked by groups 1 and 3

Functions Worksheet II

Show what will be printed by each of the following programs.

1.
```
#include <iostream>
using namespace std;
void doglobal();
void dolocal();
void doref(int&);
void doval(int);
int x;
int main()
{
   x = 15;
   doref(x);
   cout << "x = " << x << " after the call to doref\n";
   x = 16;
   doval(x);
   cout << "x = " << x << " after the call to doval\n";
   x = 17;
   dolocal();
   cout << "x = " << x << " after the call to dolocal\n";
   x = 18;
   doglobal();
   cout << "x = " << x << " after the call to doglobal\n";
   return 0;
}
void doref(int& a)
{
   a = 3;
}
void doval(int b)
{
   b = 4;
}
void dolocal()
{
   int x;
   x = 5;
}
void doglobal()
{
   x = 7;
}
```

Output:

x = 3 after the call to doref

x = 16 after the call to doval

x = 17 after the call to dolocal

x = 7 after the call to doglobal

2.
```
#include <iostream>
using namespace std;
int num = 10;
void one();
void two(int);
void three();
void four(int&);
void five(int&);
int main()
{
   int num = 1;
   cout << "At start of main num = " << num << endl;
   one();
   cout << "After call to one num = " << num << endl;
   two(num);
   cout << "After call to two num = " << num << endl;
   three();
   cout << "After call to three num = " << num << endl;
   four(num);
   cout << "After call to four num = " << num << endl;
   two(num);
   cout << "After call to two num = " << num << endl;
   one();
   cout << "After call to one num = " << num << endl;
   five(num);
   cout << "After call to five num = " << num << endl;
   one();
   cout << "After call to one num  " << num << endl;
}
void one()
{
   cout << "   At the start of one num = " << num << endl;
   num = 50;
   cout << "   At the end of one num = " << num << endl;
}
void two(int num)
{
   cout << "   At the start of two num = " << num << endl;
   num = 5;
   cout << "   At the end of two num = " << num << endl;
}
void three()
{
   int num = 100;
   cout << "   At the start of three num = " << num << endl;
   num = 200;
   cout << "   At the end of three num = " << num << endl;
}
void four(int& num)
{
   cout << "   At the start of four num = " << num << endl;
   num = 25;
   cout << "   At the end of four num = " << num << endl;
}
void five(int& i)
{
   cout << "   At the start of five num = " << num << endl;
   num = 2;
   i = 3;
   cout << "   At the end of five num = " << num << endl;
}
```

Output:

```
At start of main num = 1
   At the start of one num = 10
   At the end of one num = 50
After call to one num = 1
   At the start of two num = 1
   At the end of two num = 5
After call to two num = 1
   At the start of three num = 100
   At the end of three num = 200
After call to three num = 1
   At the start of four num = 1
   At the end of four num = 25
After call to four num = 25
   At the start of two num = 25
   At the end of two num = 5
After call to two num = 25
   At the start of one num = 50
   At the end of one num = 50
After call to one num = 25
   At the start of five num = 50
   At the end of five num = 2
After call to five num = 3
   At the start of one num = 2
   At the end of one num = 50
After call to one num  3
```

3.

```
#include <iostream>
using namespace std;
void triple(int);
int main(void)
{
   int x;
   for (x = 1; x <= 5; x++)
      triple(x);
}

void triple(int value)
{
   static int total = 0;
   int answer;
   answer = 3 * value;
   total += answer;
   cout << value << ' ' << answer << endl;
   cout << "total " << total
        << endl << endl;
}
```

Output:

```
1 3
total 3

2 6
total 9

3 9
total 18

4 12
total 30

5 15
total 45
```

4. Show what will be printed by the following program.

```
#include <iostream>
using namespace std;
int g1, g2;
void varval(int, int&);
int showscope(int);
int main()
{
   g1 = 1;
   g2 = 2;
   varval(g1,g2);
   cout << g1 << endl;
   cout << g2 << endl;
   g2 = showscope(g1);
   cout << g1 << endl;
   cout << g2 << endl;
   return 0;
}
void varval(int pm1, int&pm2)
{
   int pr1, pr2;
   pr1 = 1;
   pr2 = 2;
   pm1 = pm1 + pr1 + pr2;
   pm2 = pm2 + pr1 + pr2;
}
int showscope(int pm1)
{
   int g1, fn;
   g1 = 0;
   fn = 2;
   pm1 = pm1 + fn;
   cout << pm1 << endl;
   cout << g1 << endl;
   return g1;
}
```

Output:

1
5
3
0
1
0

5. What is the output if the input is 10?

```
#include <iostream>
using namespace std;
int secret(int, int);
void func(int x, int& y);

int main()
{
    int num1, num2;
    num1 = 6;
    cout << "Enter a positive integer: ";
    cin >> num2;
    cout << endl;
    cout << secret(num1, num2) << endl;
    num2 = num2 - num1;
    cout << num1 << " " << num2 << endl;
    func(num2, num1);
    cout << num1 << " " << num2 << endl;
    return 0;
}
int secret(int a, int b)
{
    int d;
    d = a + b;
    b = a * d;
    return b;
}
void func (int x, int& y)
{
    int val1, val2;
    val1 = x + y;
    val2 = x * y;
    y = val1 + val2;
    cout << val1 << " " << val2 << endl;
}
```

Output:

Enter a positive integer: 10

96

6 4

10 24

34 4

6. What is the output of the following program?

```
#include <iostream>
using namespace std;
void find(int a, int& b, int& c);

int main()
{
    int one, two, three;
    one = 5;
    two = 10;
    three = 15;
    find(one, two, three);
    cout << one << ", " << two << ", " << three << endl;
    find(two, one, three);
    cout << one << ", " << two << ", " << three << endl;
    find(three, two, one);
    cout << one << ", " << two << ", " << three << endl;
    find(two, three, one);
    cout << one << ", " << two << ", " << three << endl;
    return 0;
}
void find(int a, int& b, int& c)
{
    int temp;
    c = a + b;
    temp = a;
    a = b;
    b = 2 * temp;
}
```

Output:

5, 10, 15
20, 10, 15
25, 30, 15
45, 30, 60