

Worksheet Conditionals

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Week 2

1. Below are three variable declarations, followed by 5 code fragments, each ending with a conditional. State for each fragment whether it will print 'True' or not.

```
int a = 5 ;
int b = 7 ;
int c = 11
```

```
if( (a <= 5) && (b > 7) ) {
    printf("Fragment 1 True\n" ) ;
}
```

```
if( ((a < 5) && (b > 7)) || (a < b) || (b > 1000) ) {
    printf("Fragment 2 True\n" ) ;
}
```

```
if( (!(a <= 5) && !(b > 7)) ) {
    printf("Fragment 3 True\n" ) ;
}
```

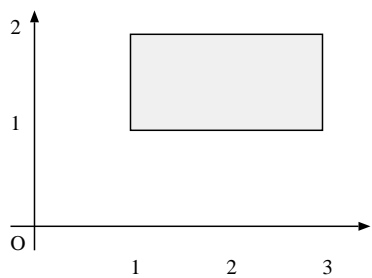
```
if( ((a <= 5) && (b > 7)) != 0 || ( c >= a*b ) ) {
    printf("Fragment 4 True\n" ) ;
}
```

```
if( (c = 1) || (b > 9) || (a < -3) ) {
    printf("Fragment 5 True\n" ) ;
}
```

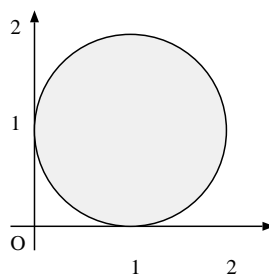
2. Simplify the three expressions in func:

```
int func( int a, int b, int c ) {
    int x0 = (a <= 5) && (b > 7) || (a < 7) ;
    int x1 = (!(a <= 5) && !(b > 7)) ;
    int x2 = ((a <= 5) || (a >= 7)) == 0 ;
    ...
}
```

3. For each of I-V below, write down the condition in C that yields true if the point (x,y) is in the shaded area. Assume there are two variables x and y , both of type double. You can assume that the line is 'in'. For example, the solution to 'VI' is " $x \geq 1$ ".

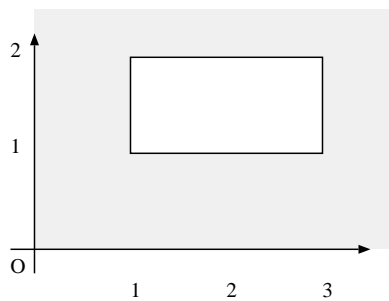


I

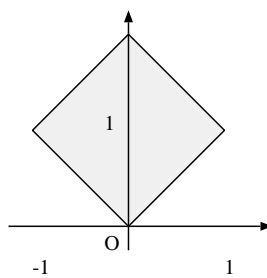


II

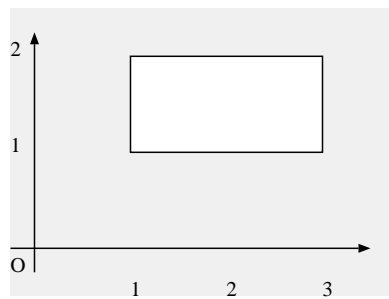
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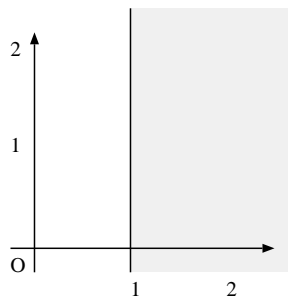
III



IV



V



VI

4. What do each of the following functions print, if called from a main program with the parameter 5? Note: not all functions will terminate. Indicate for each function whether it will terminate or not.

```
a(int y) {
    while( y >=0 ) {
        printf( "%d", y ) ;
        y = y - 1 ;
    }
}
```

```
b(int y) {
    if( y >=0 ) {
        b( y - 1 ) ;
        printf( "%d", y ) ;
    }
}
```

```
c(int y) {
    printf( "%d", y ) ;
    c( y - 1 ) ;
}
```

```
d(int y) {
    while( y > 0 ) {
        printf( "%d", y ) ;
        d( y - 1 ) ;
    }
    printf( "%d", y ) ;
}
```

```
e(int y) {
    while( y > 0 ) {
        printf( "%d", y ) ;
        y = y - 1 ;
    }
    e( y - 1 ) ;
    printf( "%d", y ) ;
}
```

```
f(int y) {
    if( y >=0 ) {
        printf( "%d", y ) ;
    }
    f( y - 1 ) ;
}
```