

**Multiple Choice:** /\* 3 points each \*/

H 1. Which of these Processing expressions generates a random value from 17 up to but not including 24?

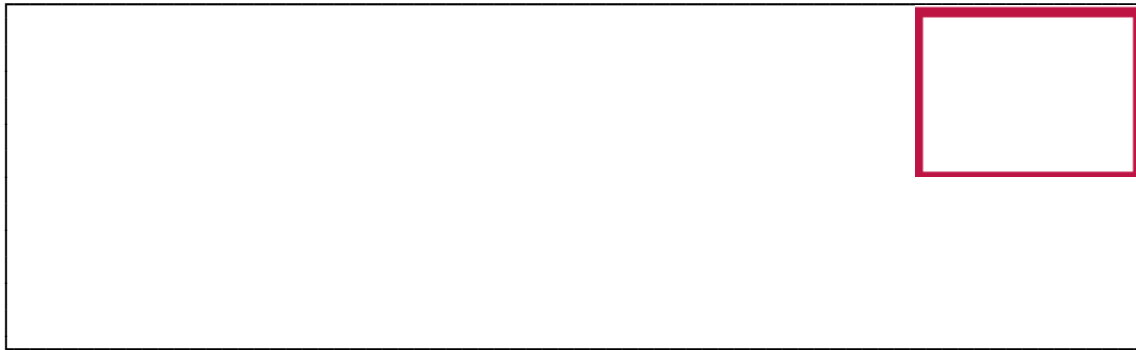
- A) random( 17, 23 )
- B) random( 17, 24 )
- C) random( 0, 6 ) + 17

- D) random( 0, 7 ) + 17
- E) Both expression A and expression C do this
- H) Both expression B and expression D do this

**Short Answer:**

1. The box below represents the output window for a Processing program. Draw a rectangle inside the box that shows the location, the width and the height of the image displayed by the following Processing code: /\* 7 points \*/

```
size( 500, 120 );  
image( img1, 400, 0, 100, 60 );
```



2. Describe in English what happens when the following program is executed, and the timing of what happens: /\* 7 points \*/

```
void draw() {  
  background(0);  
  int currentTime = millis();  
  
  if ( currentTime > 3000 ) {  
    background( 0 );  
    ellipse( 100, 100, 50, 50 );  
  }  
  else if ( currentTime > 1500 ) {  
    background( 0 );  
    rect( 0, 0, 50, 50 );  
  }  
}
```

The output window will be blank for one and one-half seconds (1500 milliseconds == 1.5 seconds).

Then for the next one and one-half seconds, there will be a square drawn in the upper left corner of the output window.

After that, there will be a circle drawn at location (100, 100) in the output window.

*Short Answer (continued):*

3. Fill in the blanks in this Processing code so that it flips a coin 500 times and counts how many heads and how many tails were flipped. /\* 7 points \*/

```
int numHeads = 0;
int numTails = 0;

for ( int flipNum = 1 ; flipNum <= 500 ; flipNum = flipNum + 1 ) {
    float percentage = random( 0, 100 );

    if ( percentage < 50 ) {
        numHeads = numHeads + 1;
    }
    else {
        numTails = numTails + 1;
    }
}

print( "heads = " );
println( numHeads );
print( "tails = " );
println( numTails );
```