

17. State the output. Use the following input data: 47 and 52, one at a time.
What is the purpose of this program? Explain the use of the break statement.

```
public static void main(String str[] ) {
    int num = Integer.parseInt(str[0]);
    int n;
    System.out.print(num + " -> ");
    for ( n = 2; n < num; n++)
        if ( num % n == 0) break;
    if (n == num)
        System.out.println("a prime.");
    else
        System.out.println("not a prime.");
}
```

18. State the output of the program. Explain the use of the continue statement.

```
int x = 5;
float y;
while (x > 0) {
    x--;
    if (x == 2) continue;
    y = 1.0f / (x - 2);
    System.out.println(x + "\t" + String.valueOf(y));
}
```

19. State the output of the program. Convert it to a while loop.

```
for (int count = 100; count > 0; count /= 4)
    System.out.print(count + "\t");
System.out.println( );
```

20. State the output of the program. Convert it to a do_while loop.

```
for (int x = 20; x > -10; x -= 5)
    System.out.print(x + "\t");
System.out.println( );
```

21. Sandy purchased a used car for \$x. The car decreased in value by y % per year. She wanted to sell the car when its value had depreciated by half. Write a program to show the value of her car each year until it was time to sell it.

22. Write a program to output the values of a given function: $y = x^2 + x + 41$ for the interval: $0 \leq x \leq 40$. Display the output in rows of 10.
(This is known as the Babbage function, since Charles Babbage used this function to test the first computer that he designed.)

23. Write a program to test that each of the above value is a prime number.