

## Homework 3 Solution

1.

3 -1 0

2.

| Value | 2's complement | 1's complement | Sign-Magnitude |
|-------|----------------|----------------|----------------|
| 27    | 0001 1011      | 0001 1011      | 0001 1011      |
| 104   | 0110 1000      | 0110 1000      | 0110 1000      |
| -42   | 1101 0110      | 1101 0101      | 1010 1010      |
| -53   | 1100 1011      | 1100 1010      | 1011 0101      |
| -127  | 1000 0001      | 1000 0000      | 1111 1111      |

3.

No. The loop variable 'i' is unsigned, which is always no less than 0. So the for-loop never ends.

4.

| Expression           | Binary Representation |
|----------------------|-----------------------|
| (int) 17             | 0001 0001             |
| (int) -17            | 1110 1111             |
| us                   | 1011                  |
| ui                   | 1000 0111             |
| (i << 1) - 15        | 1111 1111             |
| (s >> 2) << 1        | 1100                  |
| (us >> 2) << 1       | 0100                  |
| (i >> 2) - (ui >> 2) | 1100 0000             |

5.

| Constant A | Relation | Constant B |
|------------|----------|------------|
| -1         | >        | 0U         |
| 0          | >        | -1         |
| -3U        | <        | -2U        |
| -32768     | ==       | 32768U     |
| -1         | ==       | 65535U     |
| -32768     | <        | -1U        |