Name:_____ UID:_____

Week 1 CS 33 Worksheet

1.

Assume:

```
int x = rand();
int y = rand();
unsigned int ux = (unsigned int) x;
// assume that rand() can return any integer value
```

Are the following statements <u>always</u> true?

a.

```
ux >> 3 == ux / 8
```

b.

given x >= 0,

```
((x << 5) >> 6) >= 0
```

c.

```
~x + x >= ux
```

d.

given x & 15 == 11,

```
(~((x >> 3) & (x >> 2)) << 31) >= 0
```

e.

given ((x < 0) && (x + x < 0))

```
x + ux < 0
```

f.

given ((x < 0) && (y < 0) && (x + y > 0))

```
((x | y) >> 30) == -1
```

2.

a.
Suppose the 4-byte integer 0x12345678 is stored at address 0x100.
What are the bytes at the given addresses on a big endian and a little endian system?

Address	0x100	0x101	0x102	0x103
Big Endian				
Little Endian				

b.
Suppose, instead, the string "abc" is stored at address 0x100.
Hint: The ASCII codepoint for a is 0x61, b is 0x62, and c is 0x63.

Address	0x100	0x101	0x102	0x103
Big Endian				
Little Endian				

c.
Suppose, instead, the array of 2-byte shorts {0x1234, 0x5678} is stored at address 0x100.

Address	0x100	0x101	0x102	0x103
Big Endian				
Little Endian				