1.

a.

32 bytes are written to the upstream end of the pipe with each write() call, so a total of 96 bytes are written.

b.

32 bytes are read from the downstream end of the pipe with each read() call, so a total of 96 bytes are read.

c.

The output is:

```
Msg_1: Hel (Chars read: 10)
12345678901234567890123456789012345678901234567890
lo CIS370
 (Chars read: 10)
12345678901234567890123456789012345678901234567890
 (Chars read: 10)
12345678901234567890123456789012345678901234567890
```

Whenever a read() call occurs the buffer is populated with 10 characters which is then printed out.

d.

The output is:

```
Msg_1: Hello CIS370
 (Chars read: 50)
12345678901234567890123456789012345678901234567890
0
 (Chars read: 46)
12345678901234567890123456789012345678901234567890
```

And then the program hangs. This happens because the read function is trying to read more data than there is in the buffer.