Name: _________________

Directions: **Work only on this sheet** (on both sides, if needed). MAKE SURE TO COPY YOUR ANSWERS TO A SEPARATE SHEET FOR SENDING ME AN ELECTRONIC COPY LATER.

On all Tests, 32-bit word size on Intel machines running Linux is assumed unless otherwise stated.

1. (15) The name for the Intel stack pointer register is _________.

2. (20) Suppose we wish to call `scanf()` from `x.s`. Then instead of running `as`, it’s more convenient to run _________ because the latter will automatically link in the C _______.

3. (20) Suppose there is a certain C language function, `f()`, with type `int`, i.e. it has an integer return value. Suppose the compiler produces code in which the return value is held in ECX during intermediate computation. Fill in the blank in the code below, which shows what the compiler produces near the end of the function.

```c
movl __________ , __________
ret
```

4. I ran the code in pp.137-139 with GDB. Here is part of my session:

```
Breakpoint 1, addone () at AddOne.s:25
25    push %ebx
(gdb) n
30    movl 8(%esp) , %ebx
(gdb) n
32    incl (%ebx)
# need the () , since the argument was an address
(gdb) info registers
eax  0xbffff7e4  -1073743900
ecx  0xcbe07bea  -874480662
edx  0x1      1
ebx  0x804a020  134520864
esp  0xbffff718  0xbffff718
ebp  0xbffff738  0xbffff738
esi  0x0      0
edi  0x0      0
eip  0x8048439  0x8048439 <addone+5>
eflags 0x200282 [ SF IF ID ]
cs  0x73     115
ss  0x7b     123
ds  0x7b     123
es  0x7b     123
fs  0x0      0
gs  0x33     51
```

(a) (15) At what address is the return address (the “bread crumbs”) stored?

(b) (15) At what address is `x` (in the main program) stored?

(c) (15) During the execution (not fetch) of the `incl` instruction, what value(s) will be placed on the data bus?