

**Please show all work on this sheet.** Please fold your paper the long way and write **your name** and **Homework 4** (or HW 4) on the outside.

Assume the following gdb output from a Pentium workstation:

```
(gdb) # eXamine 128 bytes in hex starting at memory location "main"
(gdb) x/128xb main
0x08048a30 <main>:      0x55 0x89 0xe5 0x53 0x83 0xec 0x04 0x8b
0x08048a38 <main+8>:    0x45 0x08 0x8b 0x5d 0x0c 0x83 0xf8 0x01
0x08048a40 <main+16>:  0x75 0x0e 0xa1 0x68 0xa8 0x04 0x08 0xa3
0x08048a48 <main+24>:  0x84 0xa8 0x04 0x08 0xeb 0x5e 0x89 0xf6
0x08048a50 <main+32>:  0x83 0xf8 0x02 0x75 0x3b 0x83 0xec 0x08
0x08048a58 <main+40>:  0x68 0x5d 0x99 0x04 0x08 0xff 0x73 0x04
0x08048a60 <main+48>:  0xe8 0x73 0xfe 0xff 0xff 0xa3 0x84 0xa8
0x08048a68 <main+56>:  0x04 0x08 0x83 0xc4 0x10 0x85 0xc0 0x75
0x08048a70 <main+64>:  0x3b 0x83 0xec 0x04 0xff 0x73 0x04 0xff
0x08048a78 <main+72>:  0x33 0x68 0xa8 0x96 0x04 0x08 0xe8 0xc5
0x08048a80 <main+80>:  0xfd 0xff 0xff 0xc7 0x04 0x24 0x08 0x00
0x08048a88 <main+88>:  0x00 0x00 0xe8 0x19 0xfe 0xff 0xff 0x90
0x08048a90 <main+96>:  0x83 0xec 0x08 0xff 0x33 0x68 0xc5 0x96
0x08048a98 <main+104>: 0x04 0x08 0xe8 0xa9 0xfd 0xff 0xff 0xc7
0x08048aa0 <main+112>: 0x04 0x24 0x08 0x00 0x00 0x00 0xe8 0xfd
0x08048aa8 <main+120>: 0xfd 0xff 0xff 0x90 0xe8 0x83 0x06 0x00
```

Assume the following hexadecimal register contents:

%eax	08048a5c
%ebx	0a80881c
%ecx	0000002c
%esi	0cff5020

For each of the following instructions, give the hexadecimal contents of the %edx register after the instruction has been executed:

a. `movl %eax,%edx`

b. `movl 0x08048a88,%edx`

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c. `movl $0x08048a88,%edx`

d. `movl 20(%eax),%edx`

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e. `movl 0x05(%eax,%ecx),%edx`

f. `leal (%eax),%edx`

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g. `leal 0xfffffaab(%ebx,%esi),%edx`

h. `leal (,%ebx,2),%edx`

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i. `leal (%eax,%esi,4),%edx`

j. `leal 304(%eax,%ecx,8),%edx`

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