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I pledge my honor that I have abided by the Stevens Honor System.

```
Register group: general
x3      0x1      1
x4      0x14     20
x5      0x2      2
x6      0x1e     30
x7      0x3      3
x8      0xa      10
x9      0x28     40
x10     0x5a     90
x11     0x32     50
x12     0x8c     140
x13     0x0      0
x14     0x550083d000 365080858624
x15     0x5500851c20 365080943648
x16     0x411030 4263984
x17     0x55009fc010 365082689552
x18     0x2      2

19      MUL X10, X6, X7 // Multiply the third two elements of the array and then add the val
20      ADD X11, X8, X9 // Add the products stored in register X8 and X9 into the register X
21      ADD X12, X11, X10 // Add the sum of the first two elements respective products in re
22      STUR X12, [X16] // Store the value in register X12 into the variable dot at address
23
24      end:
25      /* Exit Function */
26      MOV X0, 0 /* status := 0 */
27      MOV X0, 93 /* exit is syscall #1 */
28      SVC 0 /* Invoke syscall */
29
30      .data
31      vec1: quad 10, 20, 30
32      vec2: quad 1, 2, 3
33      dot: .quad 0
34
35

remote Thread 1.42588 In: end L26 PC: 0x400240
(gdb) c
Continuing.
warning: Could not load shared library symbols for 2 libraries, e.g. /lib/libc.so.6.
Use the "info sharedlibrary" command to see the complete listing.
Do you need "set solib-search-path" or "set sysroot"?

Breakpoint 1, _start () at dotproduct.s:8
=> 0x0000000000400204 <_start+0>: e0 6f 08 10 adr x0, 0x411030
(gdb) c
Continuing.

Breakpoint 2, end () at dotproduct.s:26
=> 0x0000000000400240 <end+0>: 00 00 80 d2 mov x0, #0 // #0
(gdb) p $x16
$1 = 4263984
(gdb) x/ 4263984
0x411030: 140
(gdb)
```

This is for dot product, I stored the address of dot which contains the answer to the dotproduct equation, in X16.

If you see I got the memory address of x16, then x/ that memory address which output 140 which is the correct value of the dot product for those values given

```

rohan@robojesus: ~/Downloads/Stevens/CS382/Lab5
Register group: general
x0      0x411000      4263936
x1      0x411030      4263984
x2      0x411020      4263968
x3      0x0           0
x4      0x0           0
x5      0x0           0
x6      0x2           2
x7      0x2           2
x8      0x0           0
x9      0x4           4
x10     0x4           4
x11     0x8           8
x12     0x8           8
x13     0x10          16
x14     0x10          16
x15     0x0           0

lab5.s
42      SUB X15, X14, X12 // Subtract doubled distance from summed distances
43      CBZ X15, W // goto Is a right triangle
44      SUB X15, X14, X11 // Subtract doubled distance from summed distances
45      CBZ X15, W // goto Is a right triangle
46      B L // goto Not a right triangle
47
48      W:
B+      49      ADR X1, yes // Load yes into X1
50      B end // Go to end code
51      L:
52      ADR X1, no // Load no into X1
53
54      end:
55      /* Exit Function */
B+>     56      MOV X0, 0 /* status := 0 */
57      MOV X8, 93 /* exit is syscall #1 */
58      SVC 0 /* Invoke syscall */

Remote Thread 1.43497 In: end L56 PC: 0x4002a0

Breakpoint 1, _start () at lab5.s:7
=> 0x0000000000400204 <_start+0>: e0 6f 08 10 adr x0, 0x411000
(gdb) c
Continuing.

Breakpoint 2, W () at lab5.s:49
=> 0x0000000000400294 <W+0>: e1 6c 08 10 adr x1, 0x411030
(gdb) b end
Breakpoint 3 at 0x4002a0: file lab5.s, line 56.
(gdb) c
Continuing.

Breakpoint 3, end () at lab5.s:56
=> 0x00000000004002a0 <end+0>: 00 00 80 d2 mov x0, #0x0 // #0
(gdb) x/s 4263984
0x411030: "It is a right triangle."
(gdb)

```

Using the original three points given in the lab document I go through my assembly code, and after doing all the operations in my gdb assembly i did x/s (hex value stored in reg x1) and it stored the string "It is a right triangle." which is the correct answer.

```

rohan@robojesus: ~/Downloads/Stevens/CS382/Lab5
Register group: general
x0      0x411000      4263936
x1      0x411048      4264008
x2      0x411020      4263968
x3      0x0           0
x4      0xffffffff    -1
x5      0x0           0
x6      0x4           4
x7      0x3           3
x8      0x0           0
x9      0x9           9
x10     0x10          16
x11     0x32          50
x12     0x14          20
x13     0x32          50
x14     0x3c          60
x15     0xa           10

lab5.s
49      ADR X1, yes // Load yes into X1
50      B end // Go to end code
51      L:
52      ADR X1, no // Load no into X1
53
54      end:
55      /* Exit Function */
B+> 56      MOV X0, 0 /* status := 0 */
57      MOV X8, 93 /* exit is syscall #1 */
58      SVC 0 /* Invoke syscall */
59
60
61      .data
62      p1: .quad 0, -1
63      p2: .quad 0, 4
64      p3: .quad 3, 0
65      yes: .string "It is a right triangle."

Remote Thread 1.43771 In: end L56 PC: 0x4002a0
(gdb) b end
Breakpoint 2 at 0x4002a0: file lab5.s, line 56.
(gdb) c
Continuing.
warning: Could not load shared library symbols for 2 libraries, e.g. /lib/libc.so.6.
Use the "info sharedlibrary" command to see the complete listing.
Do you need "set solib-search-path" or "set sysroot"?

Breakpoint 1, _start () at lab5.s:7
=> 0x0000000000400204 <_start+0>: e0 6f 08 10 adr x0, 0x411000
(gdb) c
Continuing.

Breakpoint 2, end () at lab5.s:56
=> 0x00000000004002a0 <end+0>: 00 00 80 d2 mov x0, #0x0 // #0
(gdb) x/s 4264008
0x411048: "It is not a right triangle."
(gdb) █

```

My own points

P1: (0, -1) P2: (0, 4) P3: (3, 0)

After doing all the operations in the function and stored my answer in X1

I printed out using x/s (hex value in reg x1) and it printed not a right triangle which is the correct answer.