

CS2123 Data Structures

(10pt) Trace the following program, **show how variables change** in the memory, and **give the output**.

```
#include <stdio.h>
main()
{
    int x, y, z[3], *p1, *p2;

    p1 = &x;
    p2 = z;
    z[1] = 6;
    *p2++ = 5;
    *++p2 = 8;
    *p1 = p2 - p1;

    printf("p1=%d *p1=%d &p1=%d \n",
           p1, *p1, &p1);
    printf("p2=%d *p2=%d &p2=%d \n",
           p2, *p2, &p2);

    y = f1(x, *p1, p2-1, &p1);

    printf("x=%d y=%d z=%d p1=%d p2=%d\n",
           x, y, z[0], p1, p2 );

    printf("*p1=%d *p2=%d \n", *p1, *p2);
}

int f1(int a, int b, int *c, int **d)
{
    int x, y;

    printf("c=%d *c=%d\n", c, *c );
    printf("d=%d *d=%d **d=%d\n",
           d, *d , **d);

    *d = c - 1 ;

    x = *(c-1) = *(c+1) + **d;

    y = *(*d+1) + 2 * *c;

    return y-x;
}
```

MEMORY

name	Add ress	Content/Value
x	12	
y	16	
z[0]	20	
z[1]	24	
z[2]	28	
p1	32	
p2	36	
...		
	100	
a	104	
b	108	
c	112	
d	116	
x	120	
y	124	
	128	

OUTPUT: