Python Homework 7

In the following multiple choice questions, please circle the correct output of Python code.

1.
```
for i in range(20,0,-3):
    if (i % 2 == 0):
        print(i)
```
(a) 20 16 12 8 4 (b) 18 12 6 0 (c) 20 14 8 2 0 (d) 20 14 8 2
(e) 2 8 14 20

2.
```
nums=[0,2,4,6,8,10]
print(nums[nums[4]//4])
```
(a) 0 (b) 2 (c) 4 (d) 8 (e) 10

3.
```
nums=[]
for i in range(0,5):
    nums.append('i')
print(nums)
```
(a) 0 1 2 3 4 (b) i i i i i (c) 1 2 3 4 5 (d) i j k l m (e) 0 1 2 3 4 5

4.
```
scores=[80,90,85,82,93,88,96]
students=['john','mary','tom','ashley','bob','emily','julia']
for i in range(0,len(scores)):
    if (scores[i] > 85):
        print(students[i])
```
(a) john tom bob (b) mary bob emily julia (c) ashley bob emily julia
(d) 90 93 88 96 (e) 80 85 82

5.
```
nums=[5,3,6,8,2,5,9,3,1]
for i in range(0,len(nums)):
    _____________________
    print(nums[i])
```
Output of the code is
5 2 5
What is the missing statement?

(a) if (nums[i]%3 == 2 and nums[i] < 7):
(b) if (nums[i]%2 == 1 and nums[i] < 8):
(c) if (nums[i] < 7):
(d) if (nums[i]%3 == 2):
(e) if (nums[i]%2 == 0):

Coding question:

The question is from USACO:
http://www.usaco.org/index.php?page=viewproblem2&cpid=807

One of the farming chores Farmer John dislikes the most is hauling around lots of cow manure. In order to streamline this process, he comes up with a brilliant invention: the manure teleporter! Instead of hauling manure between two points in a cart behind his tractor, he can use the manure teleporter to instantly transport manure from one location to another.

Farmer John's farm is built along a single long straight road, so any location on his farm can be described simply using its position along this road (effectively a point on the number line). A teleporter is described by two numbers x and y, where manure brought to location x can be instantly transported to location y, or vice versa.

Farmer John wants to transport manure from location a to location b, and he has built a teleporter that might be helpful during this process (of course, he doesn't need to use the teleporter if it doesn't help). Please help him determine the minimum amount of total distance he needs to haul the manure using his tractor.

Question: please make a function teleport(a,b,x,y), here a is starting point, b is ending point, and x/y are 2 teleports. The output is the minimum of hauling distance.

Test the function with teleport(3,10,8,2). Answer is 3 (3->2 with distance 1, then 8->10 with distance 2).

Test the function with teleport(86,84,15,78). Answer is 2 (86->84 with distance 2).

Test the function with teleport(35,94,92,87). Answer is 54 (35->87 with distance 52, then 92->94 with distance 2).

You may call abs to get absolute value for any number.

Hint if you cannot think of any solution: calculate all 3 distances abs(a-b), abs(a-x)+abs(b-y), abs(a-y)+abs(b-x). Try to get minimum value from these 3 distances.