3) (10 pts) ALG (Queues)

Consider the circular array implementation of a queue named Q, implemented with the structure shown below.

```
struct queue {
    int *array;
    int num_elements;
    int front;
    int capacity;
};
```

Suppose the queue is created with a capacity of 5 and front and num_elements are initialzed to 0. Trace the status of the queue by showing the valid elements in the queue and the position of front after each of the operations shown below. Indicate front by making bold the element at the front of the queue.

1. enqueue(Q, 50);
2. enqueue(Q, 34);
3. enqueue(Q, 91);
4. x = dequeue(Q);
5. enqueue(Q, 23);
6. y = dequeue(Q);
7. enqueue(Q, y);
8. enqueue(Q, 15);
9. enqueue(Q, x);
10. x = dequeue(Q);

After stmt #1:

front

50				

After stmt #2:

front

50	34			

After stmt #3:

front

50	34	91		

After stmt #4:

front

	34	91		

After stmt #5:

front

	34	91	23	

After stmt #6:

front

		91	23	

After stmt #7:

front

		91	23	34

After stmt #8:

front

15		**91**	23	34

After stmt #9:

front

15	50	**91**	23	34

After stmt #10:

front

15	50		**23**	34

Grading: 1 pt per array, must be perfectly correct to get the point.