Question 2

Assume 4 KB pages, a four-entry fully associative TLB, and true LRU replacement. If pages must be brought in from disk, increment the next largest page number.

Initial State: Translation Look aside Buffer (TLB)

Valid	Tag	Physical Page Number
1	11	12
1	7	4
1	3	6
0	4	9

Initial State: Page Table

Valid	Physical page or in disk
1	5
0	Disk
0	Disk
1	6
1	9
1	11
0	Disk
1	4
0	Disk
0	Disk
1	3
1	12

Question: If the pages are 4KB (4096 bytes), the page number is the address shifted right by _____ bits.

For the addresses below, write the page number (in decimal), whether it is a hit in the TLB, and when applicable, whether it is a hit in the page table.

Decimal Virt. Addr.	Virt. Address	Page Number	Hit in TBL	Hit in Page Table
4095	111111111111			
31272	111101000101000			
15789	11110110101101			
15000	11101010011000			
7193	1110000011001			
4096	1000000000000			
8912	10001011010000			