

**In-Class Problems: Simple Paging**

Consider a paging-based virtual memory system with 32-bit virtual and physical addresses, and a page size of  $2^{12}$  bytes (4KB). Suppose that process  $P$  is running.  $P$  uses only 128KB of virtual memory. The first 5 entries of  $P$ 's page table are shown below.

Page #	Frame #	Valid
0x0	0x00234	1
0x1	0x00235	1
0x2	0x0023f	1
0x3	0x00ace	1
0x4	0x00004	1

Answer the following questions:

**Q1:** What is the total number of entries in  $P$ 's page table?

**Q2:** How many of the entries are valid?

**Q2:** Which physical addresses correspond to each of these virtual addresses?

- 0x00001a60
- 0x00000fb5
- 0x00004664

**Q3:** If the page size were 16KB instead of 4KB, how many entries would there be in  $P$ 's page table? How many bits of each virtual address would be used for the offset, and how many for the page number?