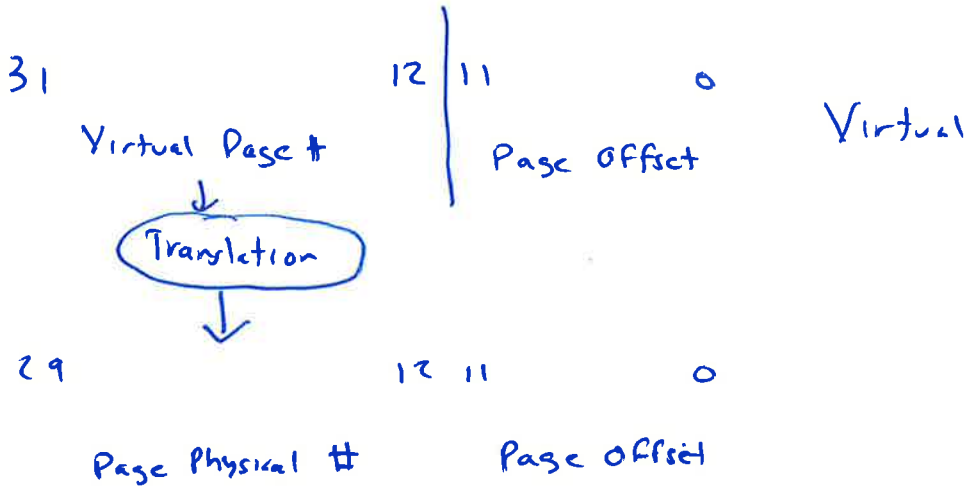
Given a 32-bit MIPS Datapath where the page size is set at 4096, the number of physical pages allowed in memory is 2^18, show how virtual mapping is performed. How big is the physical page number, and draw the representation of the Virtual-to-Physical address translation.

$\log_2(4096) = 12 \Rightarrow$ Page Offset

Virtual: $32 - 12 = 20 \Rightarrow$ Size of Virtual Page #



Given a 64-bit x86_64 Architecture where the page size is set at 4096, the number of physical address size in memory is 2^{46}, and the virtual memory address size is 2^{48}, derive the number of pages in the disk and draw the representation of the Virtual-to-Physical address translation.

$\log_2(4096) = 12 \Rightarrow$ Page Offset

Virtual Page # = 48 - 12 = 36

Physical Page # = 46 - 12 = 34

# of Pages = 2^{34}