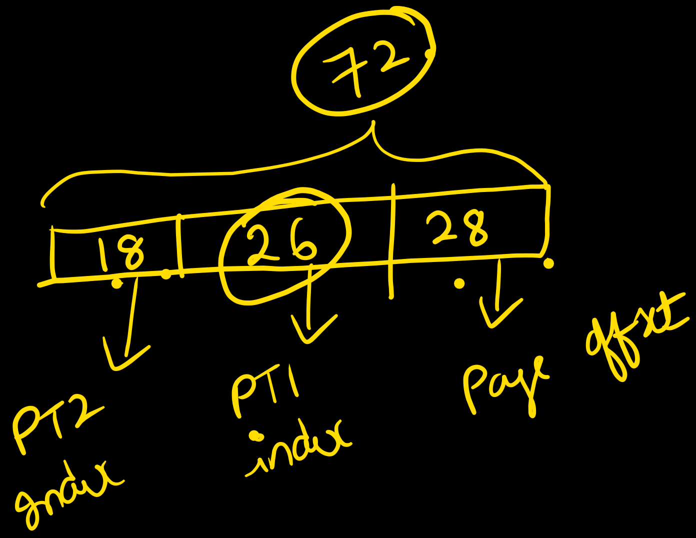
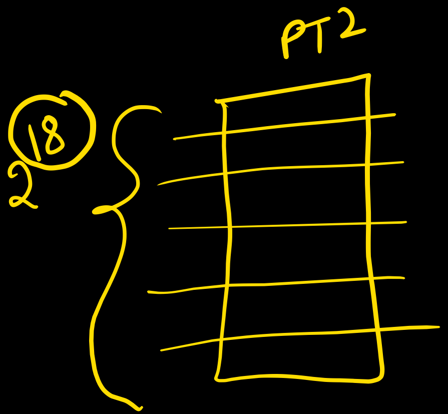
VA = 72 bits Page size = 256 MB PTE = 4 B

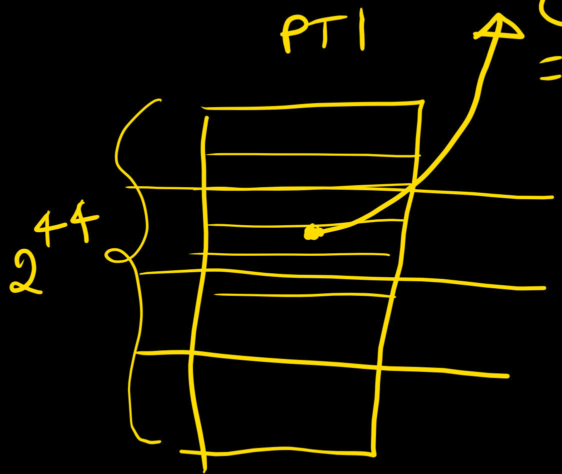
$= 2^{28}$ B





$PTS = 2^{18} \times 2^{2}$

$= 2^{20} < PS$



256 MB / 4 B $= 2^{26}$

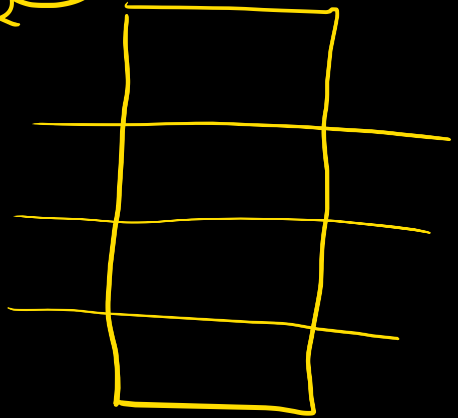
$PTS = 2^{44} \times 4$

$= 2^{46} > PS$

$\# \text{pages} = \frac{2^{46}}{2^{28}} = 2^{18}$

$46 - 28 = 18$

Process $= 2^{72}$

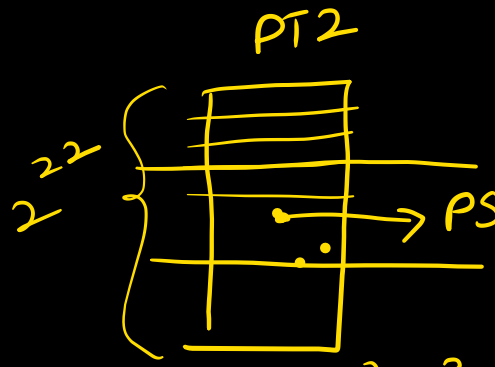


$\# \text{Pages} = \frac{2^{72}}{2^{28}} = 2^{44}$

$72 - 28 = 44$

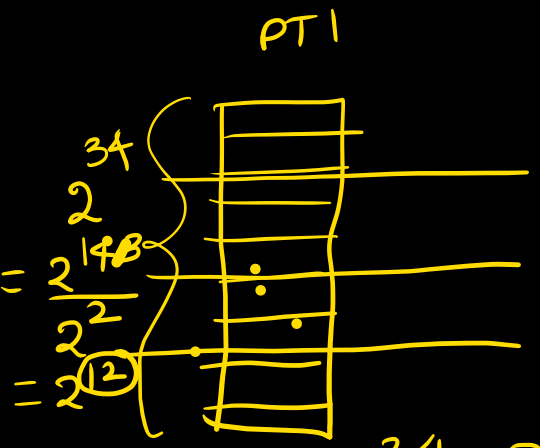
VA: 48 bits, Page size = 16KB $= 2^{14}B$, PTE = 4B $= 2^2$

PTS = $2^{10} \times 2^2$
$= 2^{12}$



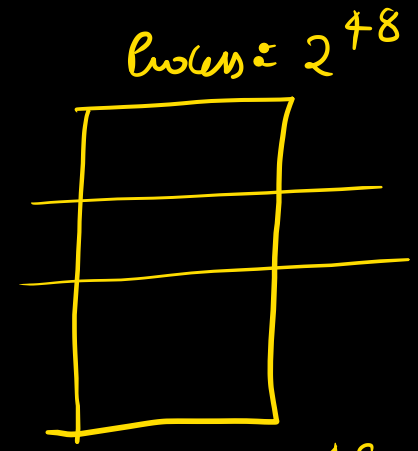
PTS = $2^{22} \times 2^2$
$= 2^{24}B$
$> PS$

Pages = $\frac{2^{24}}{2^{14}}$
$= 2^{10}$

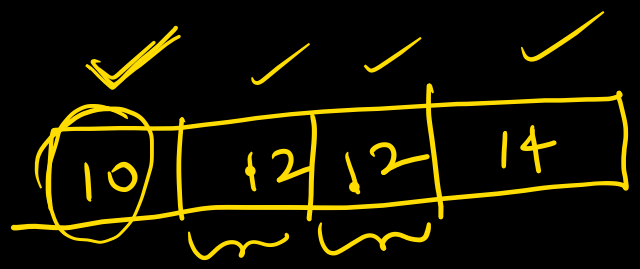


PTS = $2^{34} \times 2^2$
$= 2^{36} > PS$

Pages = $\frac{2^{36}}{2^{14}} = 2^{22}$

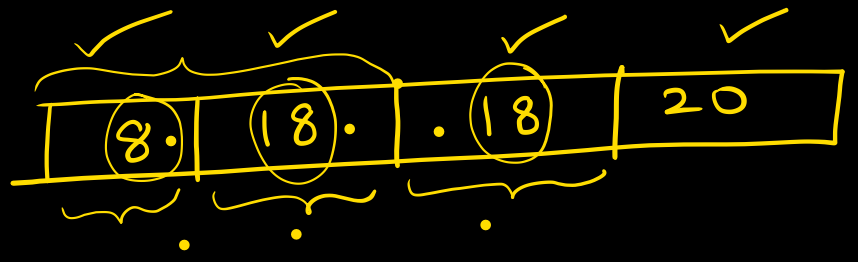


Pages = $\frac{2^{48}}{2^{14}} = 2^{34}$



VA = 64 bits, Page size = 1MB = 2^{20}, PTE = 4B

Entries in one page = $\frac{2^{20}}{2^2} = 18$

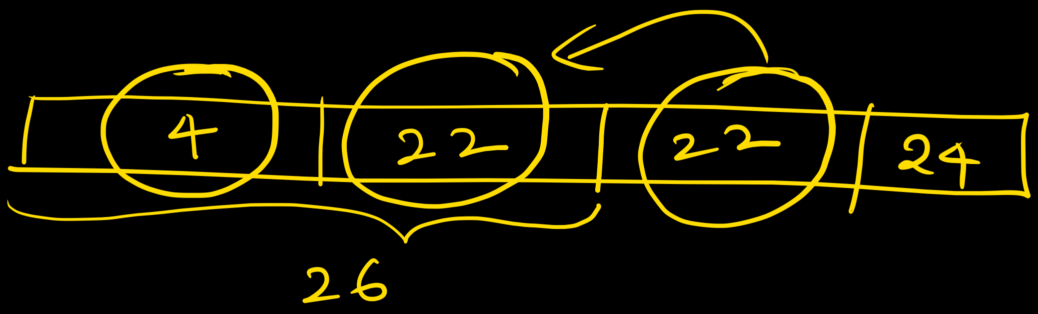


VA = 72 bits, Page Size = 16 MB, PTE = 4B

$= 2^{24} B$

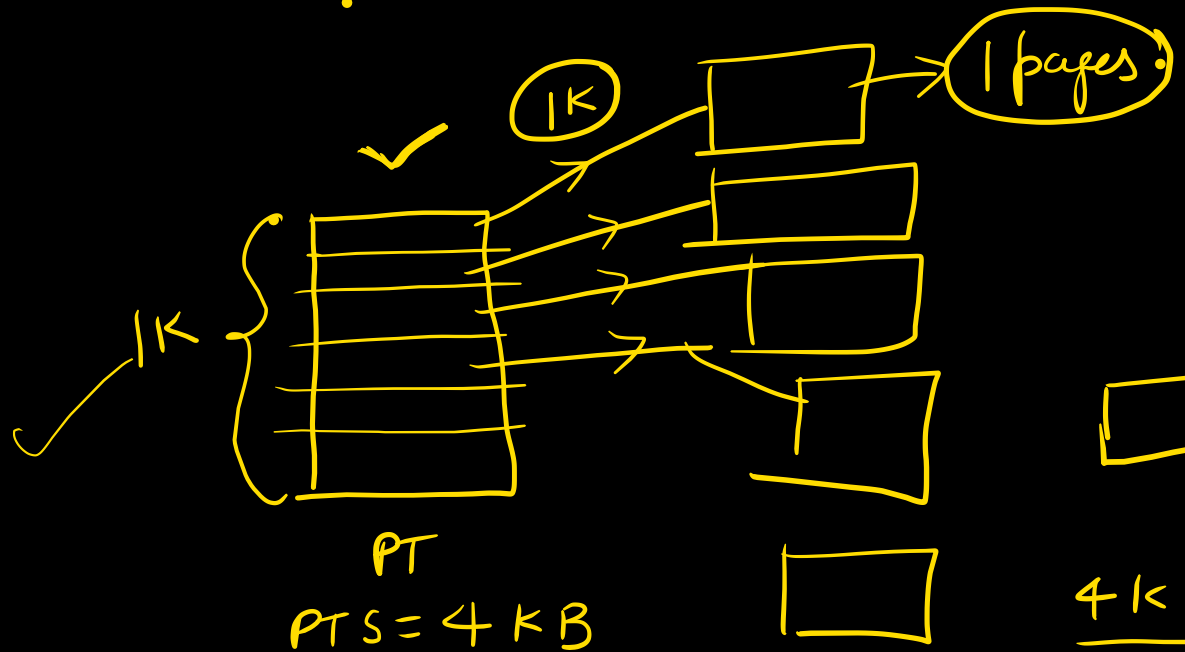
$$\text{entries} = \frac{PS}{PTE} = \frac{2^{24}}{2^{2}} = 2^{22}$$

$$72 - 46 = 26$$



Page size = 4KB PTE = 4B outer page table size = 4KB, levels of paging = 1

virtual address space = ?



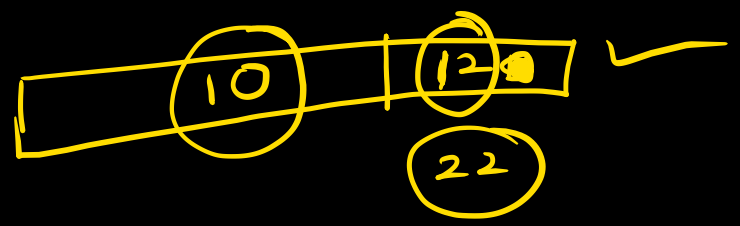
PTS = 4KB

entries = $\frac{4KB}{4B}$

= 1K

VAS = 1K * 4KB

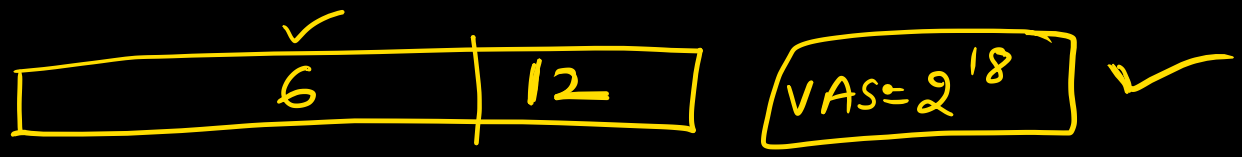
= 4MB = 2^{22} B.



$\frac{4KB}{4B}$ = PTS / PTE

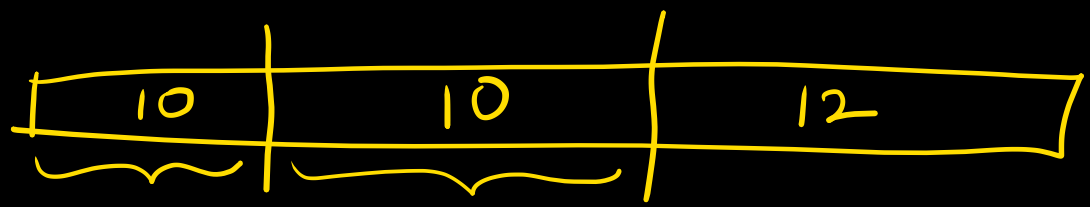
= 2^{10} → entries

Page size = 4 KB (2^{12}) PTE = 4 B outer page table size = 256 B levels of Paging = 1, VAS = ?



$$\text{entries} = \frac{\text{PTS}}{\text{PTE}} = \frac{256\text{B}}{4\text{B}} = 2^6$$

Page size = 4KB $= 2^{12}B$ PTE = 4B $= 2^2B$ outer page table size = 4KB $= 2^{12}B$, levels of paging = 2, VAS = ?



no of entries in outer page table = $\frac{2^{12}}{2^2} = 2^{10}$

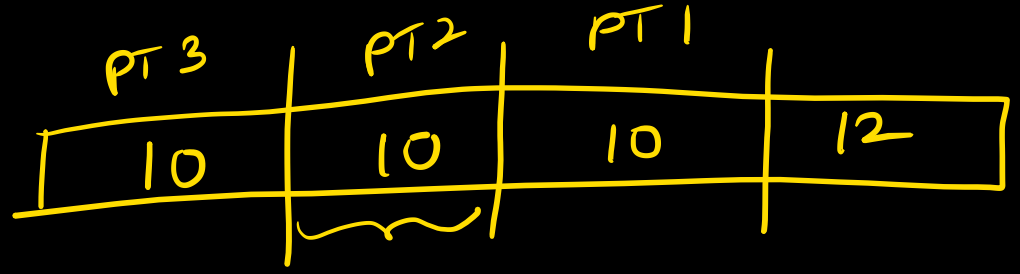
no of entries in inner page table = $\frac{\text{Page size}}{\text{PTE}} = \frac{2^{12}}{2^2} = 2^{10}$

~~No of~~ size of outer page table

size of a page.

Page size = 4KB, PTE = 4B, outer page table size = 4KB, levels of paging = 3 VAS = ?

$= 2^{12}B$



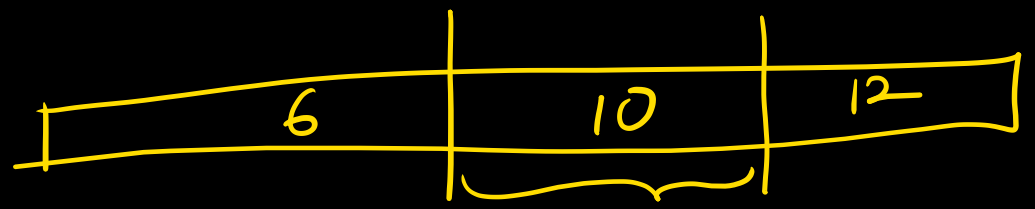
VAS = 2^{42} B.

outer entries = $\frac{4KB}{4B} = 2^{10}$

entries PT2 = $\frac{\text{Page size}}{PTE} = \frac{4KB}{4B} = 2^{10}$

" PT1 = " " "

Page size = 4KB = 2^{12}B, PTE = 4B, outer page table size = 256B, levels of page = 2, VAS = ?

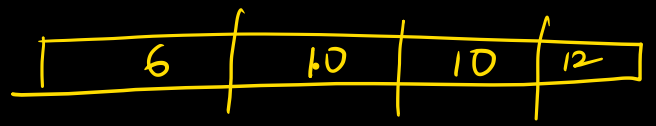


= VAS = 2^{28}

entries OPT = $\frac{256B}{4B} = 2^6$

entries IPT = $\frac{4KB}{4B} = 2^{10}$

Page size = 4KB = 2^{12} , PTE = 4B , outer page table size = 256B , level of paging = 3 , VAS = ?



VAS = 2^{38} B.

= 256 GB

outer = $\frac{256B}{4B} = 2^6$

Inner entries = $\frac{\text{Page Size}}{PTE} = \frac{4KB}{4B} = 2^{10}$