

5 chests:

$\Psi \cap \Psi, \cap \Psi \cap, \Psi \nsubseteq \epsilon, \epsilon \nsubseteq \Psi, \text{大} \text{大} Z, Z \notin \epsilon,$   
 $\nsubseteq \neq \text{大}, \nsubseteq \neq \text{大}, \nsubseteq \Psi \nsubseteq, \Psi \nsubseteq \nsubseteq$

let  $\Psi := A, \cap := B, \nsubseteq := C, \epsilon := D, \text{大} := E,$

$Z := F, \neq := G, \nsubseteq := H$

$\Rightarrow (ABA BAB) (ACD DCA) (EEF FDD)$   
 $(CGE CGE) (HAC ACH)$

Let  $\pi \in \text{choices} : \pi \text{ divides } 7 \times 11 \times 13$   
 $= 1001$

$\Rightarrow \frac{\pi}{1001}$  yields no remainder

$\Rightarrow \pi$  is a multiple of 1001

$\Rightarrow \pi = 1001 \times y, y \in \mathbb{N}$

$\Rightarrow \frac{\pi}{y} = 1001$

We also know  $\pi > 100000$

$\Rightarrow 1001y > 100000 \Rightarrow y > \frac{100000}{1001}$

$\Rightarrow y \geq 100$



Also,  $x < 999999$

$$\Rightarrow 1001y < 999999 \Rightarrow y < \frac{999999}{1001}$$

$$\Rightarrow y < 999$$

So find a  $y : y \in \mathbb{N}, 100 \leq y < 999$

such that  $\frac{x}{y} = 1001$

AND  $x$  fits pattern of one of the choices

Lets examine  $x$ 's relationship to  $y$

$$x = 1001y = 1000y + y$$

We know  $100 \leq y < 999$ , so lets represent

$y$  as  $XYZ$  where each letter is a digit

We also know any 3-digit positive integer  $y$ , when multiplied by 1000 yields the form

$XYZ000$

Adding  $y$  to a number of the form  $XYZ000$



yields  $XYZ\ XYZ$

$\Rightarrow 1000y + y = \text{number w/ form } XYZ\ XYZ$

$XYZ, XYZ$  is the same form as

$CGE, CGE$  or  $4 \neq 6, 4 \neq 6$  from above

$\Rightarrow$  Choose chest w/  $4 \neq 6, 4 \neq 6$  on  
it 