Y1: Short answer. Show no work.
 Write **DNE** in a blank <u>if</u> the described object does not exist or if the indicated operation cannot be performed.

____ a
Repeating decimal $2.3\overline{84}$ equals $\frac{n}{d}$, where posints $n \perp d$ are $n=$ .... and $d=$ ....

____ b
Let $\mathcal{P}_\infty$ denote the family of all *infinite* subsets of $\mathbb{N}$. Define relation $\bowtie$ on $\mathcal{P}_\infty$ by: $A \bowtie B$ IFF $A \cap B$ is infinite. Stmt "*This $\bowtie$ is an equivalence-relation*" is: *T F*

____ c
An explicit bijection $G:[2..\infty) \hookrightarrow\!\!\!\to \mathbb{Z}$ is this:
When n is *even*, then $G(n) :=$ ....
When n is *odd*, then $G(n) :=$ ....

____ d
16 and 6 and 13
The map $H(k,n) := 2^k \cdot [1+2n]$ is a bijection from $\mathbb{N} \times \mathbb{N} \hookrightarrow\!\!\!\to \mathbb{Z}_+$. And $H^{-1}(208) = ($ ...., ... $)$.

____ e
A bijection $f:[7,8] \hookrightarrow\!\!\!\to (0,1)$ is: $f(7) :=$ .... ;
$f($ .... $) :=$ .... , for *each* $k \in$ .... ;
and $f(x) :=$ .... , for *each* $x \in (7,8] \smallsetminus C$,
where $C :=$ ....

____ f
Sequence $\overrightarrow{\mathbf{L}} := (L_n)_{n=0}^\infty$ is defined by $L_0 := 5$, $L_1 := 4$, and $\boxed{\forall n \in \mathbb{N}:\ L_{n+2} = 2L_{n+1} + 15L_n}$. This implies $\boxed{\forall k \in \mathbb{N}:\ L_k = [P \cdot \alpha^k + Q \cdot \beta^k]}$, for real numbers
$\alpha=$ .... $< \beta=$ ....

OYOP: In grammatical English ***sentences***, write your essay on every *third* line (usually), so that I can easily write between the lines. Please put your ordinal also on the back of the last page, **large**, right-side-up.

Y2: α *The **powerset** $\mathcal{P}(\Omega)$ of set Ω, is... .*

β
Give a complete proof that there is **no** surjection $h:\Omega \twoheadrightarrow \mathcal{P}(\Omega)$. In particular, given a map $h:\Omega \to \mathcal{P}(\Omega)$, explicitly construct a set $S_h \subset \Omega$ which is *guaranteed* to **not** be in the range of h.

γ
When $\Omega := \{M,L,C\}$, the three Stooges, consider this map

$$g(M) := \{M,L,C\}\,;$$
$$g(L) := \{M,C\}\,;$$
$$g(C) := \{\}\,.$$

Your $S_g=\{$ .... $\}$.

<div style="border:1px solid blue">End of Class-Y</div>

Y1:	__ __ __		140pts
Y2:	__ __		55pts
Not triple-spaced:	__ __		−15pts
Ouch!, scratch work handed-in	:	__	−5pts
Total:	__ __ __		195pts

Please PRINT your name and ordinal. Ta:

Ord:
....

Staple!