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	In - Clas Question 1.3 (Date: 1 1201
•	S(n) and or NOT (3/n)
•	30 So i me do not & & C
	June m>0 allows one story must have
V	Since m>0 alleast one starty must have been used. Discarding any one starty learns with a valid postage. In only 6 or 15 cent starty are there s(m-6) or s(m-15) holds
	Stamps one land of stands
	$m = 6 \le m$ and $m = 6 \le m = 6$
	Contradicting on numerically of m. Six ompty Sire 3/m-6 and 3/m, 3/m-6)16
	(is ompty by 3/m-6 and 3/m, 3/m-6)+6
1	Ance 3/m
	C must be empty. Do here are no counterercomples
	A A S
	let G be the set of countercrample to the
h	roposition. * d'e.
	$C = \{n \mid \sum_{k} k^2 \neq n(n+1)(2n+1)\}$
	A - 6
*	Issum (i) non-simply typ proof by combradiction
20	2) wor there is a smallest element me C
	This m >0 decrouse $\sum_{\kappa=0}^{\infty} \kappa^2 = 0 = 0 = 0 \times (0+1) \times (2(0+1))$
	K20 6
Q	d here O & C.
)	Durie in is the smallest element of C m-1 &C
0	me m-1 & N 00 m>0.
•	$\Rightarrow \sum_{k=1}^{\infty} (m-1)(m-1+1)(2m-2+1)$
	Kan 6

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Now $\sum_{k=0}^{\infty} k^2 = \sum_{k=0}^{\infty} k^2 + m^2$	
Now 2 K - m	
= (m-1)(m)(2m-1)+	m^2
6	
[2	7
$= m \left[2m^2 - 3m + 1 \right]$	+ m
l G	1 days
$= m \left(2m^2 + 3 m t + 1\right)$, , , , , , , , , , , , , , , , , , ,
	37
m	the second second
$\sum_{m=1}^{\infty} = m(m+1)(2m+1)$	
K = 0	· January
	,
111.	- 1
This is a combaduction do me	1
be empty proon; the propos	two.
	7
3)*
	1) 2
10 10	0 11 /
Lot Che the set of all a	s sal for Vall
(9, b, c, d) such that the equ	
(9, b, c, d) such That the equal c: = {a 8a4 + 4b4 + 2c4 = 04	for some by degnit
C. = 1 a 8a + 7b + 2c = 0	0 2012 270, 50 11
	0 0 1 1 1
Assure C is non-employ from the	roof by contradiction.
	elemn poseC
By WOP there is a smallest	fu some b, C, d & IN T
Some 2 145, 2 1d4 and her	nce 2/0
=> d=25 yr 8	or sent
= 8p4+4b4+2c4= 1654	31.00.3
0 1 0	The second of th
dividing by 2	at a
4ph+2bh+ch=854	1 4 2 - 1 -
Again 2 RHS = 2 LHS=4P4264c4	= 2 C = 3 2 C
= (=2x ku)	one reliv
$\frac{2 + 2 + 3}{2} = \frac{2 + 3}{4 + 2} = \frac{2 + 3}{4$	
$= 40^{4} + 26^{4} + 167^{4} = 85^{4}$	

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	Durding 17 2 12ph+ bh 18r 4= 454)
	(2ph+ b7+8r = 75)
	Similar la previou argumento 2/12
	b = 20 to 2000 9 70 10
	$= 100^{4} + 160^{4} + 88^{4} = 45^{6}$
	Similar to previou argument 2/b and hence $b = 2q \text{for some } q \neq 1N^{\frac{1}{2}}$ $\Rightarrow 2p^{\frac{1}{2}} + 16q^{\frac{1}{2}} + 8r^{\frac{1}{2}} = 45^{\frac{1}{2}}$
	Durdy & 2. [1-1-89,4447 = 254] Again, 2 p and hemo p = 2 pt for sor pEN+ = 16 pt + 89,4447 = 254
	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
	Again, 2 p and hemo f = 2 ft for so for silver
	=> 16 7 + 89 7 +41 = 25
	3 8th + 4gh +2rh=54
1	
	dence, (+, 9, r,s) is a solution of the equation.
	But t = f < p and t & C.
	2
	This contractict the minimality of p. and
Y	hence Comust the smith proving that here
41	are no solutions Egy
	Let C:= Im bokerty m does not hole &.
1	desume Cis non-emply for proof by contradiction
	By wor, there is a smallest eternest nec.
	n to because con 2"=2 and both 0,1 <2 con
	the formed with selection the adollar envelope
	and most-not-education an emvelope
	Henre Property (m-1) holds as my the minimum
	1 2 20
	alone 100 C. Also sic n>0 n-1 1061112
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	Lare 1. The target dollars 0 st <2 m - Suice Droperty (m-1) hold. Its selection can be made four 1,2,4, 2 "envelopes and not selected 2" envelope.
	Case 2: Target 2" $< t < 2$ " Then remaining $t' = t - 2$ " are bromstrain. O $< t' < 2$ " which can be made There $1/2, 4, 2^{n-1}$ envelope.
	Hence herohert n holes contraction n E C. Tence C must be empty proving that Inoperty m holes V m C N.
	(5)
	Let $P(n) := n$ son le sapresented as the sur of non-negative intégie multiple of 6,10,15
	Let (:= d n>30 P(m) Not (P(n))? Assume (is non-empty for proof by contradute. By wor, there is a smallest m E C.
	Now $\rho(n)$ is low for $n \in \{30,31,,35\}$ as
	30 = 65×6 + 0×10 + 0×15
-	31 = 1 x6 + 1 x 10 + 1 x 15
+	$32 = 2 \times 6 + 2 \times 10 + 0 \times 15$
	$\frac{33}{3} = \frac{3}{3} \times 6 + 0 \times 10 + 1 \times 15$
+	$34 = 4x6 + 1x10 + 0x15$ $35 = 6 \times 6 + 2x10 + 1x15$
+	20 - 0 - 1 / XIO 1 X 3

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\	Hence, m >36. Also P(m-6) is brue begand m-6230 and m is minimum element of C.
	=> m-6= 6a +10b +15C a,b, C=EN = m= 6(a+1)+10b+15C As a+1,b, C C TN p(m) ho bin controlled me C Therefore, C is empty. and hence p(n) is low N > 30.
	of the state of th