ith s_i being a digit of the number at position i. $10^n \equiv 1^n \, mod\, 9$. So $N \equiv \Sigma_{i=0}^{n}(s_i)\, mod\, 9$.

newline newline
4. newline
3(3^73*10^74)mod 19, (3^18)^4 *3 mod 19, 3^73 %identical 3 mod 19, 10^74 mod 19, (10^18)^4*10^2 mod 19, 10^74 %identical 10^2 mod 19 %identical 5 mod 19. 3 "(from 3^73)" * 5 "(from 10^74)" * 3 "(from factored 3)" = 45

hw0

newline newline
5. newline
"We know " b-c=kp newline "Prove: " ab %identical ac mod p , ab-ac=kp, a(b-c)=kp rightarrow b-c=(k/a)p rightarrow b %identical c mod p

newline newline
6. newline
"The claim generally doesn't hold. For instance " 103%identical 3mod20, 103%identical 3mod4 " Does not hold since " 100
%notequal k80 " when k is an integer. However, the statement will be true when " n "|"((a-b)/m)

newline newline
7.? newline
8. newline
"Represent the number as " %SIGMA ^n sub "i=0" (s sub i*10^i). "With " s sub i " being a digit of the number at position i." 10^n %identical 1^n mod 9. "So " N %identical %SIGMA ^n sub "i=0" (s sub i) mod 9.

newline