Functional Equations [M]

Determine, with proof, all functions of from the set of positive integers to itself which satisfy f(x+f(y)) = f(x) + yfor all positive integers x, y.

Ukrcein 1999

Geometry [M]

Let AA, BB, , CC, be the altitudes of an accute triangle ABC, Oban arbitrary point inside A, B, C,. Denote the bases of the perpendiculars from 6 to the lines 'AA, and BC respectively, by Mand N respectively; the oneo from O to the lines BB, and CA resp. , by Pand Q resp., and the ones from 0 to CC, and AB resp. by Rand S resp. Prove that the lines MN, PQ, and RS are concurrent.

Czech Slovek 2001 [M] T.E.

> Find all functions f: TR - TR such that for all real numbers f(x2+fly))= (x-y)2.f(x+y)

CS 1999 Number Theory [M]

Show that for every natural number n the product $(4-\frac{2}{i})(4-\frac{2}{2})(4-\frac{2}{3})\cdots(4-\frac{2}{n})$

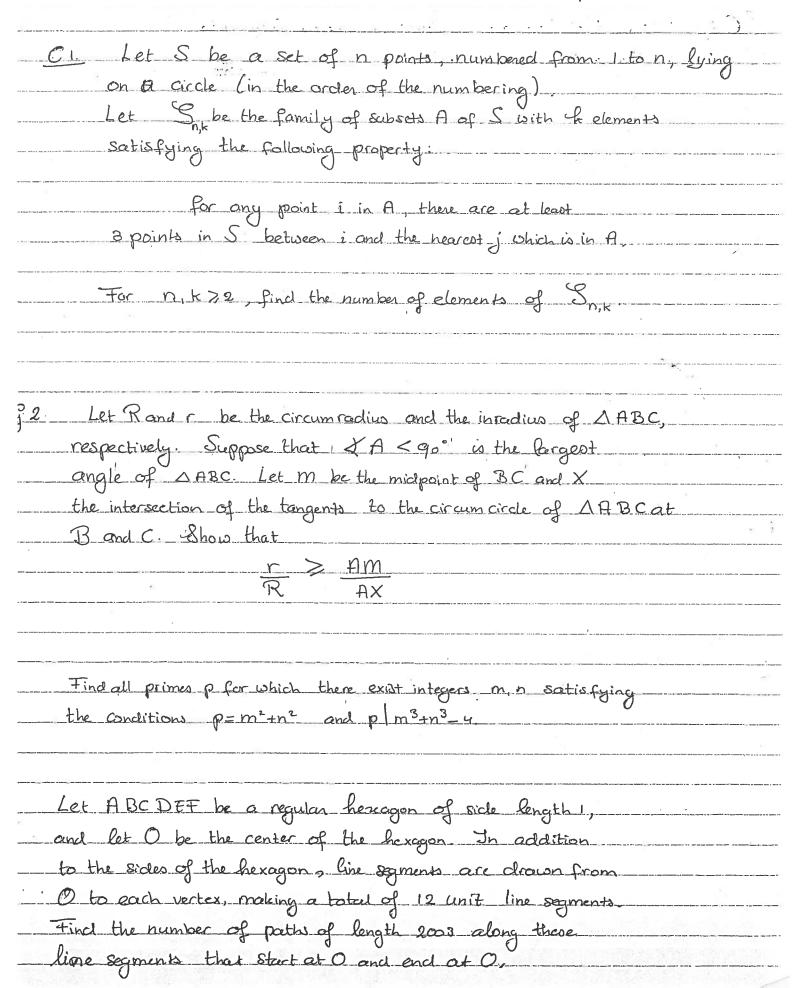
is an integer-

2005 Winter Comp

AL	Find, with reasons, all integers a, b, and C, such that
	$\frac{1}{2} (a+b)(b+c)(c+a) + (a+b+c)^3 = 1-abc$
93	Let AB be a diameter of a circle O.
0	Suppose that la, lb are tangent lines to O at A, B
	respectively. C is an arbitrary point on O. BC meets la
	at the point K. The bisector of XCAK maets CK
	at H. Misthe midpoint of the arc CAB and Sis
	the another intersection point of HM with O. I is the
.)	intersection of lb and the tangent line to Oat M.
	Show that S, T, and K are collinear.
Ŧ2,	Find all functions from the real numbers to the real
	numbers such that
	$f(nf(x) + f(y)) = (f(x))^{2} + y$
0.1	for all red numbers re and y.
MANARA	
Fy -	Find all function of R-> R sectiofying
	flory)(f(or)-fly1) = (x-y) flor) fly).

工匠4	Let X1, Dez, -, xon be arbitrary real numbers Prove
	the inequality
- 1 = 1	$\frac{1}{\sqrt{2}}$ 1
	$1+x^2$ $1+x^2+x^2$ $1+x^2+x^2+\cdots+x^2$
B v a	
W3 L	et a > b > c > d be positive integers and suppose actbd = (btd+a-c) (b+d-a+c)
	actbd = (bt d+a-c) (btd -atc)
	ENLIN TIME (1.1) TOLA WE TILL BUILLING

2006 Winter Camp



2005 Winter Camp

IMO Prelim Select Contest (1988-1997)

93-94 #10 ## (Medium)

Given 12 rods of lengths 1,2,3,-,12, in

how many ways can we chose 3 rods to

form a tridugle?

43rd Nat Math Olymp. Slovenia 1999 #1 (Medmin) Number Th.

3 3 j

Fuid all integers x and y that salisfy the equation $x^3 + 9xy + 127 = y^3$