The University Interscholastic League
Number Sense Test, Series 990 SAC

	Score	Initials
Final	_____	_____
1st	_____	_____
2nd	_____	_____

Contestant's Number _____

Read Directions Carefully Before Beginning Test

Do Not Unfold This Sheet Until Told To Begin

DIRECTIONS: Do not turn this page until the person conducting this test gives the signal to begin. This is a ten-minute test. There are 80 problems. Solve accurately and quickly as many as you can in the order in which they appear. ALL PROBLEMS ARE TO BE SOLVED MENTALLY. Make no calculations with paper and pencil. Write only the answer in the space provided at the end of each problem. Problems marked with a (*) require approximate integral answers; any answer to a starred problem that is within five per cent of the exact answer will be scored correct; all other problems require exact answers.

The person conducting this contest should explain these directions to the contestants.

Stop - Wait for Signal!

(1) $12 \times 17 =$ _____ .

(2) $.2 + 40\% + \frac{3}{10} =$ _____ (decimal).

(3) $256 \div 1.6 =$ _____ .

(4) $3 \times 6 - 4 \times 7 =$ _____ .

(5) $15 \times 420 =$ _____ .

(6) Which is larger, $\frac{11}{13}$ or $\frac{10}{11}$? _____ .

(7) $.125 =$ _____ (fraction).

(8) $3 + 5 \div 4 \times 2 - 5 =$ _____ .

(9) $19^2 =$ _____ .

*(10) $7 + 26 + 63 + 124 + 215 =$ _____ .

(11) $3\frac{3}{5} - 2\frac{1}{4} =$ _____ (mixed number).

(12) $4(3) + 36(4) + 5(8) =$ _____ .

(13) The GCD of 32, 48 and 72 is _____ .

(14) $\frac{2}{3}$ of 72 = $\frac{3}{4}$ of _____ .

(15) $16 \times \frac{16}{19} =$ _____ (mixed number).

(16) $2 + 4 + 6 + \ldots + 28 =$ _____ .

(17) $11 \times 214 =$ _____ .

(18) $4\frac{2}{5}\% =$ _____ (fraction).

(19) Find the cost of driving 127 miles at 25 cents per mile.
$ _____ .

*(20) $41259 \div 39 =$ _____ .

(21) The average of −34, 29 and 62 is _____

(22) $15 \times 3367 =$ _____ .

(23) If today is July 21, 1999, then 27 days ago was June _____ 1999.

(24) $1643 \div 7$ has a remainder of _____ .

(25) If 30 bananas cost $4.20 then 5 bananas cost ____ cents.

(26) $12^2 + 36^2 =$ _____ .

(27) The number 48 has _____ positive integral divisors.

(28) If $A = 2$, $B = 4$ and $C = 3$ then $ABC^2 =$ _____ .

(29) $314_7 =$ _____ $_{10}$.

*(30) $18 \times 39 \times 69 =$ _____.

(31) What number times 5 and added to 6, gives twice the result? _____.

(32) $57 \times 57 =$ _____.

(33) What is the perimeter of a square whose diagonal is 4? _____.

(34) $33 \times 43 + 33 \times 67 =$ _____.

(35) The product of the roots of $3x + 5x^2 = 4$ is _____.

(36) If $125 = x^2 - y^2$ and $x > y$ are positive integers then $x =$ _____.

(37) The cube root of 32,768 is _____.

(38) $98 \times 97 =$ _____.

(39) If 44 and 32 are in base 8, find the remainder when their sum is divided by 7. _____.

*(40) $18 \times 19 \times 20 \times 21 =$ _____.

(41) $.126126\ldots =$ _____ (fraction).

(42) If $(12)(42) = 21y$ then $y =$ _____.

(43) $4\frac{1}{2} \times 6\frac{1}{2} =$ _____ (mixed number).

(44) $994 \times 994 =$ _____.

(45) The sides of a triangle are 13, 27 and x. The smallest integral value of x is _____.

(46) The next term of 6,8,11,15,20, ... is _____.

(47) If $2x + 1 > 3x + 4$ then $x <$ _____.

(48) If $3^{x+1} = 13.5$ then $3^x =$ _____.

(49) How many distinct triangles can be drawn using the vertices of a regular decagon? _____.

*(50) $\sqrt{21904} =$ _____.

(51) How many degrees are in the exterior angle of a regular decagon? _____.

(52) $3 + 7 + 11 + 15 + \ldots + 63 =$ _____.

(53) The LCM of 14 and 18 is _____.

(54) If $(2 + 3i)(2 - i) = a + bi$ then $a =$ _____.

(55) $43 \times 47 =$ _____.

(56) 1 cubic foot = _____ cubic inches.

(57) If $2x + y = 6$ and $x - y = 4$ then $x =$ _____.

(58) $18 + 12 + 8 + \ldots =$ _____.

(59) Two cards are drawn without replacement from a deck of 52 cards. What is the probability that both cards are spades? _____.

*(60) $22 \times 39 + 39 \times 21 =$ _____.

(61) $2 + 4 + 8 \ldots + 128 =$ _____.

(62) If $\frac{3 + i}{1 + 2i} = a + bi$ then $b =$ _____.

(63) $\log_6 36 - \log_2 4 =$ _____.

(64) How many lines are determined by five points no three of which are collinear? _____

(65) $\cos(5\pi/6) =$ _____.

(66) 1 acre = _____ square feet.

(67) $e^{\ln 3} =$ _____.

(68) The point $(2, 5\pi/6)$ in rectangular coordinates is (x,y) and $y =$ _____.

(69) An urn contains 6 red and x white balls. Find x if the probability of drawing a red ball is 2/5. _____.

*(70) $1 + 2 + 3 + 4 + \ldots + 149 =$ _____.

(71) If $\log_5(2x + 1) = 3$ then $x =$ _____.

(72) If $f(x) = \frac{2x - 5}{3x + 4}$ and $f^{-1}(x) = \frac{ax + 5}{cx + d}$ then $d =$ ___.

(73) $25974 \div 111 =$ _____.

(74) $4^{12} \div 12$ has a remainder of _____.

(75) $1 - 2\sin^2(\pi/8) =$ _____.

(76) Find the value of x if $x + y = 12$, the product xy^2 is a maximum and $x, y > 0$. _____.

(77) If $f(x) = 2x^3 - 3x$ then $f^{-1}(2) =$ _____.

(78) $\lim_{x \to 2} (x^2 - 4) =$ _____.

(79) $\int_0^{\pi/2} \cos x \, dx =$ _____.

*(80) $22^4 =$ _____.