The University Interscholastic League
Number Sense Test, Series 9902

	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) $2099 \times 4 =$ _____.

(2) $346 \div 5 =$ _____(mixed number).

(3) $16 \times 1999 \div 2 =$ _____.

(4) $236 - 632 =$ _____.

(5) $1.4 + 2.8 + 3.8 =$ _____.

(6) $\frac{4}{5} - \frac{1}{12} =$ _____.

(7) Which is smaller, .38 or $\frac{3}{8}$? _____.

(8) XC + XX = _____(Arabic Numeral).

(9) $37^2 =$ _____.

*(10) $138 + 258 + 448 + 678 =$ _____.

(11) $2.5 \times 13.6 =$ _____.

(12) $6(5) + 50(6) + 7(10) =$ _____.

(13) How many even number integers are between 11 and 47? _____.

(14) $13 \times 213 =$ _____.

(15) $40 \div 3\frac{1}{3} =$ _____.

(16) $32 \times 27 + 38 \times 27 =$ _____.

(17) $48 \div 16 \times 8 - 4 =$ _____.

(18) $352 \div 9 =$ _____(mixed number).

(19) $230\% =$ _____(mixed number).

*(20) $379 \times 19 =$ _____.

(21) If fourteen apples cost $5.46 then one apple costs _____ cents.

(22) $24 \times 3367 =$ _____.

(23) The average of 37, 28 and 22 is _____.

(24) 18% of 48 is 27% of _____.

(25) The median of 22,30,28,26 and 24 is _____.

(26) $14 + 19 + 24 + 29 + 34 + 39 =$ _____.

(27) On a map, $\frac{1}{16}$ inch represents 15 miles. How many miles does $\frac{3}{4}$ inch represent? _____.

(28) $3\frac{3}{4}\% =$ _____(fraction).

(29) What number times four gives twice the result of adding it to five? _____.

*(30) $22 \times 50 \times 38 =$ _____.

(31) Find the smallest positive integer k such that $5k + 4$ is a prime number. k = _____.

(32) $243_7 =$ _____$_{10}$.

(33) $(13 \times 4 + 17) \div 9$ has a remainder of _____.

(34) $14^2 + 28^2 =$ _____.

(35) The ratio of the length to the width of a rectangle is 3:2. If its perimeter is 30" then its area is_____ sq. in.

(36) If (13) (93) = 39y then y =_____.

(37) $8\frac{1}{4} \times 12\frac{1}{4} =$ _____(mixed number).

(38) Find the LCM of 56 and 48. _____.

(39) If $64 = x^2 - y^2$ and x,y are positive triangular numbers, then x =_____.

*(40) $67081 \div 269 =$ _____.

(41) The product of the roots of $3x^2 - 4x = 12$ is_____.

(42) How many days are there from March 7, 2000 to April 23, 2000? _____.

(43) $97 \times 93 =$ _____.

(44) If $2x - 1 = 13$ then $2x + 3 =$_____.

(45) What is the positive geometric mean of 28 and 63? ___.

(46) Find the GCD of 224 and 168. _____.

(47) Find k such that 44k is divisible by 6. _____.

(48) The cube root of 79,507 is _____.

(49) If $5 - 3x > 14$ then $x <$_____.

*(50) $379 \times 111 =$_____.

(51) .424242... = _____ (fraction).

(52) If $4^{2x} = 1.44$ then $4^{x+1} =$_____.

(53) The area of a rhombus with diagonals 18" and 24" is _____sq. inches.

(54) $104 \times 112 =$ _____.

(55) A triangle has integral sides of 8,19 and x. The smallest value of x is_____.

(56) $18 + 12 + 8 + \ldots =$ _____.

(57) How many positive integers less than 38 are relatively prime to 38?_____.

(58) The next term of 4,7,13,25... is _____.

(59) What is the 3rd triangular number plus 1? _____.

*(60) $22^3 =$_____.

(61) $\sin 135° \cos 135° =$_____.

(62) $(2 + 3i)(4 - i) = a + bi$ and a =_____.

(63) If $f(x) = x \log_4 x$ then f(16) =_____.

(64) How many 4-digit numbers end in a 2? _____.

(65) Three dice are tossed. Find the probability of getting a sum of 3. _____.

(66) $\tan(\pi/4) =$ _____.

(67) The simplified sum of the coefficients of the expansion $(3x - y)^5$ is_____.

(68) $\sec(\cos^{-1} .5) =$_____.

(69) If $f(x) = 2x - 3$ then f[f(5)] =_____.

*(70) $70^2 \times 140^2 \div 35^2 =$_____.

(71) If $f(x) = \frac{x + 2}{4x - 3}$ and $f^{-1}(x) = \frac{-3x + b}{cx + d}$ then c =_____.

(72) The conjugate of -2 + 3i is _____.

(73) $4^{-1} + 3^{-2}$ _____.

(74) If $f(x) = 2x + 1$ then $f^{-1}(7) =$_____.

(75) If $3x + 5 \equiv 0 \pmod 7$, $0 \le x \le 6$, then x = ___.

(76) Find the value of y if $x + y = 20$, the product xy^4 is a maximum and x,y > 0. _____.

(77) If $f(x) = 3x^2 + 4x$ then $f'(2) =$_____.

(78) $\lim_{x \to 0} \frac{\sin x}{x} =$ _____.

(79) $\int_0^1 x^2 \, dx =$ _____.

*(80) $142857 \times 12 =$ _____.