The University Interscholastic League
Number Sense Test, Series 9903

	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) $9903 + 3099 =$ _____ .

(2) $11 \times 345 =$ _____ .

(3) $123 \div .75 =$ _____ .

(4) $.45\% =$ _____ (fraction).

(5) $942 - 249 =$ _____ .

(6) $843 \div 5 =$ _____ (decimal).

(7) $54^2 =$ _____ .

(8) $.3 + 60\% + \frac{9}{10} =$ _____ (decimal).

(9) $36 - 32 \times 16 \div 8 =$ _____ .

*(10) $864 - 532 + 624 - 412 + 856 =$ _____ .

(11) The average of 48, -32 and 11 is _____ .

(12) $14 \times 112 =$ _____ .

(13) The GCD of 135 and 210 is _____ .

(14) $2145 \div 9 =$ _____ (mixed number).

(15) How many odd integers are between 13 and 88? _____ .

(16) $9(8) + 71(9) + 10(13) =$ _____ .

(17) How many positive prime numbers divide 210? _____ .

(18) $\frac{7}{12} + \frac{12}{7} =$ _____ (mixed number).

(19) What number times five and substracted from 42, gives the same result? _____ .

*(20) $15500 \div 124 =$ _____ .

(21) If 6 apples cost $2.04 then 15 apples cost $ _____ .

(22) $\frac{11}{13} \times 11 =$ _____ (mixed number).

(23) $9 + 14 + 19 + 24 + 29 + 34 =$ _____ .

(24) The reciprocal of .26 is _____ (improper faction).

(25) $(15 \times 7 + 9) \div 8$ has a remainder of _____ .

(26) If you travel 288 miles in 6 hours then your average speed was _____ miles per hour.

(27) If $(36)(84) = 48y$ then $y =$ _____ .

(28) Find x if $x - 4y = 9$ and $x - 2y = 3$. _____ .

(29) $3367 \times 22 =$ _____ .

*(30) $24 \times 71 \times 15 =$ _____ .

(31) How many days are there from February 15, 2000 to April 15, 2000? _____ .

(32) Which is larger, $\frac{8}{11}$ or $\frac{9}{13}$? _____ .

(33) If $59 = x^2 - y^2$ and x, y are positive integers, then $x =$ _____ .

(34) $15857 \div 101 =$ _____ .

(35) If $A = 3$, $B = 4$ and $C = 5$ then $B^2AC^2 =$ _____.

(36) The LCM of 84 and 60 is _____.

(37) The cube root of 148,877 is _____.

(38) 18% of 54 is _____ % of 12.

(39) If $47^2 - 41^2 = 4k$ then $k =$ _____.

*(40) $\sqrt{27556} =$ _____.

(41) The length of a rectangle is three times its width. If its perimeter is 20" then its width is _____ in.

(42) .37777... = _____ (fraction).

(43) The next term of 0, 3, 8, 15, 24, ... is _____.

(44) If $f(x) = x^4 - 6x^2 + 9$ then $f(3) =$ _____.

(45) If $x^{-1} + 5^{-1} = 6^{-1}$ then $x^{-1} =$ _____.

(46) If $5^3 = x^2 - y^2$, x and y are negative triangular numbers, then $y =$ _____.

(47) $15\frac{1}{3} \times 6\frac{1}{3} =$ _____ (mixed number).

(48) $56^2 + 55^2 =$ _____.

(49) Find the distance between the point (3, -4) and the line $x = -1$. _____.

*(50) $23 \times 29 + 28 \times 22 =$ _____.

(51) 95.7 is what percent less than 110? _____ %.

(52) $3 + 1 + 3^{-1} + 9^{-1} + \ldots =$ _____.

(53) An urn contains 12 red and x white balls. Find x if the probability of drawing a red ball is 4/13. _____.

(54) $109 \times 112 =$ _____.

(55) The sides of a right triangle are integers. If one leg is 11 then the other leg is _____.

(56) The largest root of $(3x - 1)^2 = 16$ is _____.

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

(58) $1^2 - 2^2 + 3^2 - 4^2 + 5^2 =$ _____.

(59) If $\log_x 7 = 2$ then $x =$ _____.

*(60) $24^2 \times 48^2 \div 36^2 =$ _____.

(61) $\log 3 + \log 4 - \log 12 =$ _____.

(62) A regular pentagon has _____ distinct diagonals.

(63) Two numbers are in the ratio of 3:4. If their sum is 63, find the larger number. _____.

(64) $4 + 8 + 12 + 16 + \ldots + 56 =$ _____.

(65) .5 cubic foot = _____ cubic inches.

(66) If $2x + 1 > 3x - 1$ then $x <$ _____.

(67) $\sin(\pi/3) =$ _____.

(68) How many positive two digit integers are odd? _____.

(69) $\sin^{-1}(\sin .2) =$ _____.

*(70) $38 \times 40 \times 42 =$ _____.

(71) $113_4 =$ _____ 16.

(72) $\ln(e^3) =$ _____.

(73) How many positive integers less than or equal to 42 are relatively prime to 42? _____.

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

(75) [x] denotes the greatest integer less than or equal to x. $[e] =$ _____.

(76) Find the value of x if $x + y = 14$, the product of xy^2 is a maximum and $x, y > 0$. _____.

(77) $\lim_{x \to 4} \frac{2x - 8}{x^2 - 16} =$ _____.

(78) $3^8 \div 12$ has a remainder of _____.

(79) $\int_{-1}^{1} x^3 \, dx =$ _____.

*(80) $(1 + 2 + 3 + \ldots + 19)^2 =$ _____.