The University Interscholastic League
Number Sense Test, Series 9904

	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) $9904 + 4099 =$ _____.

(2) $17 \times 32 =$ _____.

(3) $.035 =$ _____ (fraction).

(4) $\frac{1}{4} + \frac{1}{6} =$ _____.

(5) $1417 \div 5 =$ _____ (mixed number).

(6) $.25 \times 4.2 =$ _____ (decimal).

(7) $15 \times 340 =$ _____.

(8) $6123 - 2361 =$ _____.

(9) CXL = _____ (Arabic Numeral).

*(10) $42 - 31 + 75 - 64 + 122 + 356 =$ _____.

(11) 18% of $6\frac{2}{3} =$ _____.

(12) $43 \times 68 + 32 \times 68 =$ _____.

(13) $\frac{4}{7} + \frac{7}{4} =$ _____ (mixed number).

(14) $12 + 13 \times 14 - 15 =$ _____.

(15) The average of 23, 37 and 48 is _____.

(16) $27 \times \frac{27}{29} =$ _____ (mixed number).

(17) The GCD of 162 and 198 is _____.

(18) $11\,(10) + 85\,(11) + 12\,(15) =$ _____.

(19) The LCM of 48 and 40 is _____.

*(20) $19310 \div 139 =$ _____.

(21) If today is May 6, 2000 then 23 days ago was April _____, 2000.

(22) $63 \times 63 =$ _____.

(23) What number times four gives three times the result of adding it to two? _____.

(24) $32 \times 3367 =$ _____.

(25) If one dozen pencils cost $3.48 then three pencils cost _____ cents.

(26) $27\frac{2}{3} \div 5 =$ _____ (mixed number).

(27) If x% of 140 = 16.8 then x = _____.

(28) $(9 \times 7 + 6) \div 8$ has a remainder of _____.

(29) 40% of 66 is 60% of _____.

*(30) $18 \times 49 \times 69 =$ _____.

(31) $6 \times 6\frac{5}{7} =$ _____ (mixed number).

(32) If $(43)(68) = 86y$ then $y =$ _____.

(33) $1122_3 =$ _____

(34) $53 \times 67 =$ _____.

(35) If $8^3 = x^2 - y^2$ and x,y are positive triangular numbers, then y = _____.

(36) $6\frac{1}{3} \times 9\frac{2}{3} =$ _____(mixed number).

(37) The ratio of the width to the length of a rectangle is 6:7. Its area is 168 and its length is _____.

(38) The cube root of 551,368 is _____.

(39) 23643 ÷ 111 = _____.

*(40) $\sqrt{51529}$ = _____.

(41) The sum of the roots of $6x^2 + 2x = 5$ is_____.

(42) .0121212... =_____ (fraction).

(43) If $3^{x-1} = 14$ then 3^x =_____.

(44) If $4x + 1 = -7$ then $2x + 1$ = _____.

(45) $76^2 + 53^2$ = _____.

(46) The next term of 3, 5, 9, 17, 33, ... is_____.

(47) The distance between the points (3, 7) and (9, 9) is $a\sqrt{b}$ and b = _____.

(48) 43 x 45 + 2 = _____.

(49) The number 52 has_____positive integral divisors.

*(50) 29 x 28 + 28 x 27 = _____.

(51) Find the length of the altitude to the hypotenuse of a 9, 12, 15 right triangle. _____

(52) 3 + 7 + 11 + 15 + ... + 71 =_____.

(53) The sum of the positive integral divisors of 44 is_____.

(54) The smallest palindrome greater than 132 is _____.

(55) The length of the minor axis of the ellipse $4x^2 + y^2 = 16$ is _____.

(56) The supplement of a 63° angle is _____°.

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

(58) If $\log_9 x = 1.5$ then x =_____.

(59) 72 is the _____ term in the sequence 7, 12, 17, 22 ... .

*(60) 26 x 26 x 26 =_____.

(61) An urn contains 8 red and x white balls. Find x if the probability of drawing a red ball is 2/9._____.

(62) 112 x 113 = _____.

(63) How many three member committees can there be formed from a group of six people?_____.

(64) The modulus of 3 − 4i is _____.

(65) If $f(x) = 4 - \log_2 x$ then f(4) = _____.

(66) sin330° = _____.

(67) (2 + 3i)(4 − i) = a + bi and a = _____.

(68) How many three digit numbers can be formed from {0, 2, 6, 9}? _____.

(69) Change .34 base 6, to a base 10 fraction._____.

*(70) 5.25 x 111111 ÷ 21 =_____.

(71) A pair of dice are tossed. Find the probability of getting a sum of 8._____.

(72) $1^2 - 2^2 + 3^2 - 4^2 + \ldots - 16^2$ =_____.

(73) The odds of winning are 2 to 3. What is the probability of winning?_____.

(74) $4^8 \div 7$ has a remainder of_____.

(75) $\lim_{x \to 2} \frac{x^3 - 8}{x - 2}$ =_____.

(76) The nth term of 2, 7, 12, 17, ... is_____.

(77) Find the value of xy^3 if $x + y = 8$, $x, y > 0$ and xy^3 is a maximum._____.

(78) If $f(x) = \frac{2x - 1}{x - 3}$ and $f^{-1}(x) = \frac{ax + b}{cx + 2}$ then b =_____.

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

*(80) 48 x 49 x 50 =_____.