The University Interscholastic League
Number Sense Test, Series 990A

	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) $1999 \times 200 =$ _____ .

(2) $514 \div 5 =$ _____ (decimal).

(3) $25 \times 143 =$ _____ .

(4) $562 - 265 =$ _____ .

(5) Whis smaller, $\frac{5}{7}$ or $\frac{7}{9}$? _____ .

(6) $1257 \div 9 =$ _____ (mixed number).

(7) $745 + 547 =$ _____ .

(8) $22 \times 22 =$ _____ .

(9) $11 + 12 \times 13 - 14 =$ _____ .

*(10) $103 + 108 + 115 + 124 + 135 =$ _____ .

(11) 12% of $35 + 15 =$ _____ .

(12) $15 \times 18 + 30 \times 9 =$ _____ .

(13) $16 - 12 - 8 - 4 - 1 =$ _____ .

(14) $5(4) + 43(5) + 6(9) =$ _____ .

(15) The LCM of 48 and 36 is _____ .

(16) $17 \times 37 =$ _____ .

(17) $1.5\% =$ _____ (fraction).

(18) $23 \times \frac{23}{25} =$ _____ (mixed number).

(19) $4 + 8 + 12 + 16 + 20 + 24 =$ _____ .

*(20) $61 \times 18 \times 49 =$ _____ .

(21) What number times 3 and added to 18, gives the same result? _____

(22) $321 \div 7$ has a remainder of _____ .

(23) $3367 \times 14 =$ _____ .

(24) The ratio of the length to the width of a rectangle is 9:5. Its perimeter is 84 and its area is _____ .

(25) $43 \times 43 =$ _____ .

(26) If x% of $150 = 57$ then $x =$ _____ .

(27) $.43333 \ldots =$ _____ (fraction).

(28) The number 120 has _____ positive integral divisors.

(29) $23\frac{1}{4} + 5 =$ _____ (mixed number).

*(30) $15945 \div 19 =$ _____ .

(31) If $3x + 1 = 4x + 5$ then $x =$ _____ .

(32) $4\frac{2}{3} \times 8\frac{2}{3} =$ _____ (mixed number).

(33) If $17 = x^2 - y^2$ and x,y are positive integers then $x =$ _____ .

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

(35) If $x^2 - y^2 = 30$ and $x + y = 6$ then $x - y =$ ____.

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

(37) If 3 A's and 2 B's cost \$6.05 and 2 A's and B cost \$3.65 then A costs \$_____.

(38) If (31) (26) = 62y then y = _____.

(39) 112 x 103 = _____.

*(40) 29 x 17 x 19 = _____.

(41) If $4^{x+y} = 9$ and $4^{x-y} = 4$ then $4^{2x} =$ _____.

(42) The sum of the roots of $2x^3 + 2x^2 = x$ is _____.

(43) The next term of 27,24,19,12,3,...is _____.

(44) 84 x 86 = _____.

(45) If 35 and 43 are in base 9, find the remainder when their sum is divided by 7. _____.

(46) $16^2 + 59^2 =$ _____.

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

(48) If $1 - x > 2 - 2x$ then $x >$ _____.

(49) If (3,4) is the midpoint of the line segment through the points (4,7) and (a,b) then a = _____.

*(50) $\sqrt{2000} =$ _____.

(51) If $(3 + 2i) + (a + bi) = 7 - 3i$ then b = _____.

(52) 1 + .5 + .25 + .125 + ... = _____.

(53) If $\log_x 16 = -2$ then x = _____.

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

(55) The perimeter of a regular hexagon is 24". Its area is _____ sq. in.

(56) 2 miles = _____ feet.

(57) $(1 + i) \div (1 - i) = a + bi$ and b = _____.

(58) If $43_b = 35$ then b = _____.

(59) 3 + 8 + 13 + 18 + ... + 88 = _____.

*(60) 14 x 27 + 15 x 28 = _____.

(61) If $\log_3 5 = \log_9 x$ then x = _____.

(62) If tanA = 1, A is in QIII then A = _____ radians.

(63) The sum of the coefficients in the expansion of $(x + 2y)^3$ is _____.

(64) 111 x 213 = _____.

(65) The simplified coefficient of the x^4y^2 term in the expansion of $(2x - y)^6$ is _____.

(66) $31_9 \div 4_9 =$ _____.

(67) The odds of winning are 5 to 8. What is the probability of losing? _____.

(68) $\sin^{-1}(.5) =$ _____ degrees.

(69) Change .44, base 6, to a base 10 fraction. _____.

*(70) 142857 x 15 = _____.

(71) Find the value of y if $x + y = 20$, the product xy^3 is a maximum and x,y > 0. _____.

(72) What is the 4th triangular number? _____.

(73) If $f(x) = x^2 - 2$, find f[f(3)]. _____.

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

(75) $14^7 \div 9$ has a remainder of _____.

(76) An urn contains 9 red and x white balls. Find x if the probability of drawing a red ball is 3/7. _____.

(77) If $1 < x < 4$ then $x^2 - 1 <$ _____.

(78) The nth term of 4,9,14,19,... is _____.

(79) $\int_1^8 x^{-2}\, dx =$ _____.

*(80) $34^3 =$ _____.