The University Interscholastic League
Number Sense Test, Series 978A

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

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) $1998 - 9819 =$ _____ .

(2) $2.3 \times 2.7 =$ _____ .

(3) $\frac{3}{5} - \frac{5}{11} =$ _____ .

(4) $402 \div 9 =$ _____ (Mixed Number).

(5) $34^2 =$ _____ .

(6) $11 \times 198 =$ _____ .

(7) $1421 \div 7 =$ _____ .

(8) XC = _____ (Arabic Numeral).

(9) $\frac{5}{4} - \frac{5}{8} - \frac{5}{12} =$ _____ .

*(10) $35 + 355 + 3555 + 35555 =$ _____ .

(11) $932 + 239 =$ _____ .

(12) $15 \times 48 =$ _____ .

(13) 14% of 220 = _____ % of 440.

(14) $\frac{5}{8} =$ _____ % (Mixed Number).

(15) The mean of 15, 27, 39 and 15 is _____ .

(16) .22% = _____ (fraction).

(17) $12 \times 213 =$ _____ .

(18) $57 \times 24 + 18 \times 24 =$ _____ .

(19) If 8 pens cost $3.80 then 12 pens cost $ _____ .

*(20) $397 \times 249 =$ _____ .

(21) How many days are there from April 3, 1997 to June 20, 1997? _____ .

(22) $1^3 + 2^3 + 3^3 + 4^3 =$ _____ .

(23) The largest prime number less than 100 that is a multiple of two is _____ .

(24) How many minutes are there from 10:40 p.m. to 6 a.m. the next morning? _____ min.

(25) $13 - 5 + 23 - 15 + 33 - 25 =$ _____ .

(26) $(42 \times 7 + 5) \div 8$ has a remainder of _____ .

(27) How many odd integers are between 9 and 43? _____ .

(28) .121212... = _____ (fraction).

(29) If $3x + 5 = 14$ then $3x - 4 =$ _____ .

*(30) $\frac{1}{16} \times 3 \times 32.32 \times 64 =$ _____ .

(31) Find the value of k so that the slope of the line $3kx + 4y = 3$ is 2. k = _____ .

(32) 14 is _____ % (mixed number) of 80.

(33) The ratio of the length to the width of a rectangle is 5:4. If its perimeter is 72 in. then its length is _____ in.

(34) $8\frac{3}{4} \times 8\frac{3}{4} =$ _____ (Mixed Number).

(35) The LCM of 16, 24 and 32 is _____.

(36) 352 x 358 = _____.

(37) If $3^x = 81$ then x + 2 = _____.

(38) $33^2 - 30^2 = (7)$ _____.

(39) Find the simple interest on $500 at 5% for 3 months.
$ _____.

*(40) $\sqrt{20164}$ = _____.

(41) What number times four and added to 15 gives the same result? _____.

(42) 89 x 98 = _____.

(43) A right triangle has integral sides. If one leg is 7 then the length of the hypotenuse is _____.

(44) If $3^{-1} + x^{-1} = 7^{-1}$ then x = _____.

(45) How many elements are in the Cartesian product of the sets {1, 4, 9} and {3, 7}? _____.

(46) $13^2 + 29^2$ = _____.

(47) If x + y = 17 and 2x – y = –5 then x = _____.

(48) If $3^x = 2.1$ then 9^x = _____.

(49) How many degrees are in the exterior angle of a regular pentagon? _____ deg.

*(50) 24157 ÷ 119 = _____.

(51) $(3 + 5i)^2 = a + bi$ and b = _____.

(52) The next term of 3, 8, 7, 12, 11, 16, ... is _____.

(53) If $\log_2 4 = x$ then x = _____.

(54) 2 + 4 + 6 + ... + 20 = _____.

(55) How many 3 member committees can be formed from a group of 9 people? _____.

(56) .21111... = _____ (fraction).

(57) 109 x 104 = _____.

(58) If $42_{b+1} = 26$ then b – 1 = _____.

(59) The radius of the inscribed circle of a 10, 24, 26 right triangle is _____.

*(60) 15 x 16 x 17 = _____.

(61) Find the volume of a pyramid if the area of the base is 12 in^2 and the height is 4 in. _____ in^3.

(62) Find the number of positive proper fractions in lowest terms with a denominator of 22. _____.

(63) If $\cos 421° = \cos(360° + A)$, $0° < A < 90°$, then A =
_____ deg.

(64) If log2 = .3 and logx = 1.2 then x = _____

(65) In a 5, 12, 13 right triangle, if $\cos B = \frac{12}{13}$ then cos2B = _____.

(66) 18 + 6 + 2 + ... = _____.

(67) Five coins are tossed. Find the probability of getting 4 heads and 1 tail. _____.

(68) 111 x 123 = _____.

(69) Change .31, base 4, to a base 8 decimal. _____.

*(70) 23 x 89 – 22 x 69 = _____.

(71) Write the first four non-zero digits of the decimal for $\frac{23}{90}$: 0. _____.

(72) $4^6 \div 7$ has a remainder of _____.

(73) What is the sixth triangular number? _____.

(74) How many lines are determined by 5 points, no three of which are collinear? _____.

(75) $\cos^{-1}(.2) + \cos^{-1}(-.2)$ = _____ degrees.

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

(77) The nth term of 2, 5, 10, 17, ... is _____.

(78) The dot product of the vectors (2, 4) and (3, –2) is ____.

(79) $\int_1^4 x^{-2}\,dx$ = _____.

*(80) 142857 x 22 = _____.