The University Interscholastic League
Number Sense Test, Series 978 SAC

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) $956 - 659 =$ _____.

(2) $42 \times 25 =$ _____.

(3) $212 \div 9 =$ _____ (Mixed Number).

(4) $519 + 915 =$ _____.

(5) $11 \times 213 =$ _____.

(6) Which is larger, $\frac{3}{8}$ or .376? _____.

(7) $18^2 =$ _____.

(8) $28 \times 5 \div 7 + 3 =$ _____.

(9) $2514 - 1425 =$ _____.

*(10) $13 + 133 + 1333 + 13333 =$ _____.

(11) $12 \div 1\frac{1}{2} =$ _____.

(12) $\frac{3}{8} - \frac{3}{16} - \frac{1}{24} =$ _____.

(13) $321 \times 9 - 1 =$ _____.

(14) $\frac{13}{15} \times 13 =$ _____ (Mixed Number).

(15) $\frac{3}{40} =$ _____ % (decimal).

(16) $15 \times 62 =$ _____.

(17) $43 \times 23 - 23 \times 23 =$ _____.

(18) $1 + 2 + 3 + 4 + \ldots + 12 =$ _____.

(19) The average of 12, 30, 36 and 22 is _____.

*(20) $85172 \div 398 =$ _____.

(21) $4\frac{1}{3} \times 6\frac{1}{3} =$ _____ (Mixed Number).

(22) $1 + 8 + 15 + 22 + 29 + 36 =$ _____.

(23) How long is it from Jan. 3, 1997 to April 4, 1997?
_____ days.

(24) The GCD of 24, 78 and 42 is _____.

(25) The product of the prime numbers between 4 and 10 is
_____.

(26) $(32 \times 6 + 9) \div 7$ has a remainder of _____.

(27) $42 \times 58 =$ _____.

(28) $214_5 =$ _____ $_{10}$

(29) Find the value of k so that the slope of the line
$4x - 2ky = 1$ is -2. k = _____.

*(30) $2\frac{3}{4} \times 128764 \div 11 =$ _____.

(31) $4\frac{3}{10} \times 4\frac{7}{10} =$ _____ (Mixed Number).

(32) $.686868\ldots =$ _____ (fraction).

(33) How many minutes are there from 9:15 p.m. to 7 a.m. the next morning? _____ min.

(34) 2 quarts = _____ ounces.

(35) The GCD of 24 and x is 8 and their LCM is 96. x = ___.

(36) 653 x 657 = _____.

(37) If x is to 6 as 8 is to 12 then x = _____.

(38) 2.4 is what percent of 20? _____ %.

(39) If the perimeter of a square changes from 8 in. to 24 in., the area is multiplied by _____.

*(40) 29 x 31 + 29 x 28 = _____.

(41) $3 \div 4^{-1}$ = _____.

(42) The product of the roots of $x^2 - 4x = 9$ is _____.

(43) 91 x 96 = _____.

(44) If $5^{-1} + x^{-1} = 2^{-1}$ then x = _____.

(45) The next term of 1, 6, 12, 19, 27, . . . is _____.

(46) 1122_3 = _____ 9.

(47) If $8^x = 4^2$ then x = _____.

(48) If x – y = 5 and x + y = 9 then $x^2 - 2xy + y^2$ = _____.

(49) $24^2 + 38^2$ = _____.

*(50) .2 x 25.25 x 5 x 5 = _____.

(51) A triangle has integral sides of 3, x and 5. The largest value x can be is _____.

(52) 102 x 109 = _____.

(53) $\frac{2\pi}{3}$ radians = _____ degrees.

(54) If $y = \log_4 x$ then x = _____.

(55) $(3 + 2i)^2 = a + bi$ and a = _____.

(56) $\cos\pi$ = _____.

(57) An equilateral triangle has an area of $12\sqrt{3}$ sq. units. Its height is _____ units.

(58) If $(\log_{10}2)(\log_2 4) = \log_{10} x$ then x = _____.

(59) The vertex of the parabola $y = x^2 + 4x + 5$ is (h, k) and h = _____.

*(60) 21 x 22 x 23 = _____.

(61) The distance between the points (3, 4) and (–1, y) is 5. y has how many solutions? _____.

(62) $2\cos^2 30° - 1$ = _____.

(63) If $|3 - x| = 8$ and $x > 0$ then x = _____.

(64) If $x - 7 > 7 - x$ then x > _____.

(65) The area of the ellipse $9x^2 + 4y^2 = 1$ is $k\pi$ and k = ___.

(66) The nth term of 1, 3, 6, 10, . . . is _____.

(67) The smallest palindrome greater than 265 is. _____.

(68) Four coins are tossed. Find the probability of getting 3 heads and 1 tail. _____.

(69) Write the first four nonzero digits of the decimal for $\frac{16}{90}$: 0. _____.

*(70) 142857 x 17 = _____.

(71) In a 3, 4, 5 right triangle if $\cos B = \frac{4}{5}$ then cos2B = _____.

(72) The simplified third term in the expansion of $(x + y)^4$ is _____.

(73) A sphere has a volume of 36π in^3 and a surface area of $k\pi$ in^2. k = _____.

(74) Let t_n denote the nth triangular number. Find the value of $t_2 + t_3$. _____.

(75) Change .23, base 4, to a base 8 decimal. _____.

(76) The radius of an inscribed circle in a 5, 12, 13 right triangle is _____ units.

(77) Find x, $0 \le x \le 4$, if $3x - 1 = 3 \pmod 5$ _____.

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

(79) $\int_1^3 x^{-2}\,dx$ = _____.

*(80) 25^4 = _____.