The University Interscholastic League
Number Sense Test, Series 934B

Contestant's Number _____ Contestant's Score _____

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) $1994 - 994 - 94 =$ _____ .

(2) $7(13) + 7(14) + 7(13) =$ _____ .

(3) $434 \div 9 =$ _____ (Mixed Number).

(4) $53(8+3) =$ _____ .

(5) $1428 \div 7 =$ _____ .

(6) $3\frac{5}{6} + 1\frac{1}{3} =$ _____ (Mixed Number).

(7) 14 is _____ % of 40.

(8) $\frac{3}{8} =$ _____ %.

(9) $75 \times 56 =$ _____ .

*(10) $219 \times 42 =$ _____ .

(11) XXI + V = _____ (Arabic Numeral).

(12) $14 \times 21 + 14 \times 39 =$ _____ .

(13) .14 = _____ (fraction).

(14) $32^2 =$ _____ .

(15) If 1 gram = .04 oz., then 2 oz. = _____ grams.

(16) $3112 - 1231 =$ _____ .

(17) The largest prime divisor of 354 is _____ .

(18) $17 \div 2\frac{1}{2} =$ _____ (decimal).

(19) Find the cost of driving a car 42 miles at $.25 per mile.
$ _____ .

*(20) $90504 \div 216 =$ _____ .

(21) The mean of 72, 60, 64 and 52 is _____ .

(22) $3 + 6 + 9 + 12 + \ldots + 42 =$ _____ .

(23) $(64 - 3 \times 7) \div 4$ has a remainder of _____ .

(24) $6\frac{1}{2} \times 36 =$ _____ .

(25) Evaluate F(4.1) if $F(x) = x^2 - 4x + 4$. _____ .

(26) $3.4 \times 3.6 =$ _____ .

(27) How many integers between 8 and 82 are divisible by 8?
_____ .

(28) If $x = 4$ and $y = -5$ then $(x - y)^3 =$ _____ .

(29) $\frac{1}{11}$ of a gallon = _____ cubic inches.

*(30) How many seconds in one day? _____ .

(31) The sum of three consecutive integers is 633. The smallest integer is _____ .

(32) $35^2 - 31^2 =$ _____ .

(33) .373737 ... = _____ (fraction).

(34) $5\frac{1}{4} \times 5\frac{3}{4} =$ _____ (Mixed Number).

(35) Find y if $x - y = 9$ and $2x + y = 30$. $y =$ _____ .

(36) The LCM of 14, 20, and 28 is _____ .

(37) The sum of the roots of $3x^2 + 6 = 9x$ is _____.

(38) $15 \times 86 =$ _____.

(39) $111 \times 32 =$ _____.

*(40) $\sqrt{47081} =$ _____.

(41) 116 is what percent more than 80? = _____%.

(42) $52 \times 58 =$ _____.

(43) Find the digit $B > 0$, such that $2B4 + B21 = 1215$. B = _____.

(44) 47_9 _____ $_{10}$.

(45) Find k, so that k3k is the largest 3-digit number divisible by 4. k = _____.

(46) $43 \times 63 =$ _____.

(47) How many real roots does $x^3 - 8 = 0$ have? _____.

(48) The next term of 7, 12, 19, 28, 39, ... is _____.

(49) If the sides of an equilateral triangle are $\sqrt{12}$ inches then its altitude is _____ inches.

*(50) $(17)^3 =$ _____.

(51) The remainder, in base 8, when 153, base 8 is divided by 7 is _____.

(52) Find the modulus of $7 + 24i$ _____.

(53) The distance from (1,1) to (5,5) is _____.

(54) The smallest palindrome greater than 910 is _____.

(55) Three coins are flipped. What is the probability that all three coins are heads? _____.

(56) $997^2 =$ _____.

(57) The x-intercept farthest to the right for $f(x) = 2x^2 + 3x - 2$ is x = _____.

(58) If $\log_a 3 = .5$ then $\log_a 27 =$ _____.

(59) y varies inversely as x. If x = 4 when y = 9, find x when y = 3. x = _____.

*(60) $48 \times 219 + 440 \times 24 =$ _____.

(61) $\det \begin{vmatrix} 5 & 8 \\ 7 & 2 \end{vmatrix} =$ _____.

(62) $12^0 =$ _____ radians.

(63) The eighth pentagonal number is _____.

(64) 1.252525... = _____ (Improper fraction).

(65) How many ways can you place five distinct books on a bookshelf? _____.

(66) Two dice are rolled. What is the probability that the sum of the numbers showing is greater than 9? _____.

(67) $(\ln 2)(\log_2 e) =$ _____.

(68) $16 + 4 + 1 + \ldots =$ _____.

(69) If $18^6 \div 4 = (2^x)(3^y)$, x and y are positive integers, then x = _____.

*(70) $36 \times 142857 =$ _____.

(71) The inverse of $y = 1 + \sqrt{x}$ is y = _____.

(72) Change .24, base 5, to a base 10 decimal. _____.

(73) If $\sec 2 = A$, $A \in QI$, then A = _____ degrees.

(74) $123_5 \times 3 =$ _____ $_5$.

(75) How many gallons are in a rectangular box 4" by 42" x 11"? _____ gallons.

(76) The slope of the tangent line to $x^2 + y^2 = 4$ at y = 2 is _____.

(77) $\lim_{x \to 5} \dfrac{x^2 - 25}{x - 5} =$ _____.

(78) The minimum value of $y = 3x^2 + 2$ is _____.

(79) $\int_0^4 (3 - x)\, dx =$ _____.

*(80) $(1 + 2 + 3 + \ldots + 16)^2 =$ _____.