The University Interscholastic League
Number Sense Test, Series 978B

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) $2.37 + 14.53 =$ _____.

(2) $\frac{4}{7} - \frac{7}{15} =$ _____.

(3) $25 \times 125 =$ _____.

(4) $222 \div 9 =$ _____ (Mixed Number).

(5) $28^2 =$ _____.

(6) $259 \times 11 =$ _____.

(7) $24 \div 8 \times 4 + 2 =$ _____.

(8) Which is smaller, $\frac{3}{7}$ or $\frac{4}{9}$? _____.

(9) $3009 \div 6 =$ _____ (decimal).

*(10) $29 + 299 + 2999 + 29999 =$ _____.

(11) The mean of 13, 21 and 25 is _____.

(12) $\frac{6}{7} - \frac{6}{14} - \frac{8}{21} =$ _____.

(13) If 1 gram = .04 oz., then 42 grams = _____ oz.

(14) $3\frac{3}{4}\% =$ _____ (fraction).

(15) $6\frac{1}{3} \times 36 =$ _____.

(16) $5 + 9 + 13 + 17 + \ldots + 49 =$ _____.

(17) $3\frac{1}{4} \div 2\frac{1}{2} =$ _____ (decimal).

(18) $1.32\% =$ _____ (fraction).

(19) Find the cost of driving a car 64 miles at $.28 per mile.

$ _____.

*(20) $\frac{1}{4} \times 16.64 \times 8 \times 8 =$ _____.

(21) $(42 \times 7 + 12) \div 8$ has a remainder of _____.

(22) $(28 \times 13) + (13 \times 42) =$ _____.

(23) $\frac{1}{3}$ of a gallon = _____ cubic inches.

(24) How many days are there from Jan. 6, 1996 to March 15, 1996? _____.

(25) $\frac{11}{13} \times 11 =$ _____ (Mixed Number).

(26) The sum of three consecutive odd integers is 111. The smallest integer is _____.

(27) $29^2 - 31^2 =$ _____.

(28) Find the value of k so that the slope of the line $6x - ky = 2$ is 2. k = _____.

(29) The largest prime number less than 29 is _____.

*(30) $\sqrt{165} + \sqrt{735} =$ _____.

(31) The simple interest on $1000 at 6% for 8 months is $ _____.

(32) .545454... = _____ (fraction).

(33) A team won 87.5% of its 48 games. How many did it lose? _____.

(34) The LCM of 28 and 32 is = _____.

(35) The sum of the roots of $6x^2 + 4x + 2 = 0$ is _____.

(36) 451 x 459 = _____.

(37) The perimeter of a square is 12 inches. Its area is _____ sq. in.

(38) If $2x - 6 = 18$ then $2x + 5 =$ _____.

(39) How many months in one year have 30 days? _____.

*(40) 32 x 17 + 31 x 16 = _____.

(41) The smaller root of $(2x + 1)^2 = 4$ is _____.

(42) If the sides of an equilateral triangle are $\sqrt[4]{3}$ inches, then its area is _____ sq. in.

(43) 54 is what percent more than 40? _____ %.

(44) $47_8 =$ _____ 10

(45) If $4^{-1} + x^{-1} = 2^{-1}$ then x = _____.

(46) The next term of 2, 5, 11, 23, 47,... is _____.

(47) 98 x 93 = _____.

(48) Find the digit $B > 0$, such that $3B7 + 1B26 = 1773$. B = _____.

(49) If $1 - 2x < 7$ then $x >$ _____.

*(50) 24 x 25 x 26 = _____.

(51) $(3 + 2i)(3 - 2i) =$ _____.

(52) $39^2 + 13^2 =$ _____.

(53) Find the number of distinguishable permutations of the letters in the word, "Tommy." _____.

(54) Find the modulus of $3 + 4i$. _____.

(55) The surface area of a sphere with a radius of 2 in. is $k\pi$ in.^{2}. k = _____.

(56) 108 x 106 = _____.

(57) If $\log_2 8x = 6$ then x = _____.

(58) 111 x 23 = _____.

(59) A regular n–gon has an exterior angle of 18 deg. n = _____.

*(60) $(.625 \times 333)^2 =$ _____.

(61) 3 + 1.5 + .75 + ... = _____.

(62) The radius of the inscribed circle of a 3, 4, 5 right triangle is _____ units.

(63) If $\log_5 4 + \log_5 6 = \log_5 x$ then x = _____.

(64) Two dice are rolled. Find the probability that the sum is 7 or 11. _____.

(65) If $2^x = 3$ then $2^{x-2} =$ _____.

(66) Find the number of positive fractions in lowest terms with a denominator of 32. _____.

(67) In a 3, 4, 5 right triangle if $\cos A = \frac{3}{5}$ then $\cos 2A =$ _____.

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

(69) Six coins are tossed. Find the probability of getting 2 heads and 4 tails. _____.

*(70) $18^4 =$ _____.

(71) Change .11, base 4, to a base 8 decimal. _____.

(72) Let t_n denote the nth triangular number. Find the value of $t_4 + t_5$. _____.

(73) $\sin^3(\pi/6) =$ _____.

(74) Write the first four nonzero digits of the decimal for $\frac{29}{90}$; 0. _____.

(75) $(123_4) + (3_4) =$ _____ 4

(76) If $2 < x < 5$ then $x^2 - 1 <$ _____.

(77) The slope of the tangent line to $x^2 + y^2 = 1$ at x = 0 is _____.

(78) The nth term of 4, 7, 10, 13,... is _____.

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

*(80) $(1 + 2 + 3 + \ldots + 10)^2 =$ _____.