The University Interscholastic League
Number Sense Test, Series 9564

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) $45 - 18 + 15 - 12 =$ _____.

(2) $312 \div 9 =$ _____ (Mixed Number).

(3) $\frac{5}{16} \times 320 =$ _____.

(4) $8463 \div 21 =$ _____.

(5) $29^2 =$ _____.

(6) $1\frac{2}{3} + \frac{5}{6} =$ _____ (Mixed Number).

(7) $1.4 \times 1.5 =$ _____.

(8) $6789 + 9876 =$ _____.

(9) $75 \times 84 =$ _____.

(8) $3 \div 5 \div 4 \times 2 - 5 =$ _____

*(10) $9 + 161 + 38 + 4217 - 119 =$ _____.

(11) The LCM of 24 and 18 is _____.

(12) Which is larger, $\frac{7}{9}$ or .78? _____.

(13) $11 + 19 + 27 + 35 + 43 =$ _____.

(14) $28 \times 24 \div 21 + 3 =$ _____.

(15) How many multiples of 3 are between 7 and 38? _____.

(16) $\frac{7}{16} =$ _____ % (Mixed Number).

(17) $2\frac{4}{5}$ meters = _____ centimeters.

(18) $9 \times 7654321 - 1 =$ _____.

(19) 125 + 12% of 250 is _____.

*(20) $118 \times 29 \div 119 \times 30 =$ _____.

(21) Find the cost of driving a car 27 miles at $.29 per mile.

$ _____.

(22) $15 \times 52 =$ _____.

(23) 26 is what percent less than 40? _____ %.

(24) $(27 + 8 \times 3) \div 4$ has a remainder of _____.

(25) $\frac{7}{2^2(5)} =$ _____ (decimal).

(26) The sum of the positive integral divisors of 44 is _____.

(27) $24^2 + 48^2 =$ _____.

(28) If $10^n = 1$ trillion then $n =$ _____.

(29) $17 \times 43 =$ _____.

*(30) $25665 \div 145 =$ _____.

(31) Divide 85 into 2 parts such that the larger number exceeds the smaller number by 21. Find the larger number. _____.

(32) $37_9 =$ _____

(33) Find the area of a square if its diagonal is 16 inches.

_____ sq. in.

(34) If $\frac{3}{2x} = \frac{x}{24}$, $x > 0$ then $x =$ _____.

(35) $3.3 \times 3.7 =$ _____.

(36) $.424242\ldots =$ _____ (fraction).

(37) If $x + y = 3$ then $(x + y)^2 - 1 =$ _____.

(38) $72^2 - 32^2 =$ _____.

(39) If $x + 2y = 16$ and $y = .3x$ then $x =$ _____.

*(40) $231 \times 459 + 1800 =$ _____.

(41) $4^2 - 3 =$ _____ (base 3).

(42) $\frac{1}{8}$ of a mile = _____ feet.

(43) The geometric mean of 5 and 125 is _____.

(44) The next term of 3,7,15,31,63,... is _____.

(45) $23643 \div 111 =$ _____.

(46) $93 \times 96 =$ _____.

(47) $1358 \div 9 =$ _____ (Mixed Number).

(48) If $x - 2 < 2x - 3$ then $x >$ _____.

(49) Find the distance between the points (3,4) and (9,12)

_____.

*(50) $\sqrt{19880} =$ _____.

(48) If $3^{2x} = 13.5$ then $3^x =$ _____.

(51) What is the largest divisor of 130 which is less than 35?

_____.

(52) $1 + 2 + 3 + \ldots + 14 =$ _____.

(53) If $x > 0$ and $|3x - 5| = 16$ then $x =$ _____.

(54) $\cos^2 30° + \sin^2 60° =$ _____.

(55) A triangle has integral sides of 6,11 and x. The largest value of x is _____.

(56) $(4 + 5i) \div i = a + bi$ and $a =$ _____.

(57) $73^2 + 23^2 =$ _____.

(58) ${}_7C_3 =$ _____.

(59) $\log_3(1/9) =$ _____.

*(60) $427680 \div 216 =$ _____.

(61) The area of the ellipse $9x^2 + 4y^2 = 36$ is $k\pi$ and $k =$ _____.

(62) If $\sec^2 A = 3$ then $\tan^2 A =$ _____.

(63) The simplified coefficient of the third term of $(x + 2y)^6$ is _____.

(64) $214 \times 111 =$ _____.

(65) Find the number of proper fractions in lowest terms with a denominator of 52. _____.

(66) $.1131313\ldots =$ _____ (fraction).

(67) If $f(x) = 2x + \log_5 x$, find $f(5)$. _____.

(68) $33_5 \div 2_5 =$ _____$_5$.

(69) The length of the tangent from (13,0) to the circle $x^2 + y^2 = 25$ is _____.

*(70) $26 \times 142857 =$ _____.

(71) Find x, $0 \le x \le 12$, if $3x - 1 \equiv -2 \pmod{13}$. _____.

(72) Let t_n denote the nth triangular number. Find the value of $t_1 + t_3$. _____.

(73) Change .34 base 5, to a base 10 decimal. _____.

(74) The radius of the inscribed circle of a 24,70,74 right triangle is _____.

(75) If $f(x) = \frac{x - 2}{4}$ then $f^{-1}(x) =$ _____.

(76) $3^9 \div 12$ has a remainder of _____.

(77) $\lim_{x \to 0} \frac{\sin 4x}{x} =$ _____.

(78) Two dice are rolled. Find the probability that the sum is a multiple of 5. _____.

(79) $\int_0^{12} (x + 2)\,dx =$ _____.

*(80) $(1 + 3 + 5 + \ldots + 17)^2 =$ _____.