The University Interscholastic League
Number Sense Test, Series UU-D

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 only approximate 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) $21.57 \times 10^2 - 61 =$ _____.

(2) $715 + 213 - 19 + 14 =$ _____.

(3) $6\ 1/4\% =$ _____ (decimal).

(4) $54 \times 56 =$ _____.

(5) $921 \div 9 =$ _____ (Mixed Number).

(6) $25 \times 202 =$ _____.

(7) $73^2 =$ _____.

(8) 123 = 3/40 of _____.

(9) 16 is what percent of 128? _____ %.

*(10) $10^2 + 12^2 + 14^2 =$ _____ (Integer).

(11) 4/7 of 4 feet 8 inches = _____ inches.

(12) The LCM of 8, 20 and 32 is _____.

(13) $10 + 11 + 12 + \ldots + 20 =$ _____.

(14) $(3 \times 4^2 \times 5^2) \div (4 \times 5) =$ _____ (numeral).

(15) The median of 4, 8, 12, 20, 10, and 18 is _____.

(16) $28^2 - 24^2 = 2 \times$ _____.

(17) $1/20 + 1/30 + 1/42 =$ _____.

(18) If two dozen balls cost $30.00, how much do two balls cost? $ _____.

(19) DCXV = _____ (Arabic Numeral).

*(20) $(45 \times 55)^2 =$ _____ (Integer).

(21) The range of the set 4, 8, 6, 5, 10 is _____.

(22) The sum of the roots of $4x^2 - 8x + 12 = 0$ is _____.

(23) $4\ 1/4 \times 8\ 1/4 =$ _____.

(24) The product of the prime factors of 84 is _____.

(25) The additive inverse of $(2)^{-1}$ is _____.

(26) $(43_5)(4_5) =$ _____ 5.

(27) $.\overline{4} + .\overline{5} =$ _____ (fraction).

(28) A trapezoid has bases of 5" and 8". The altitude is 16". The area is _____ square inches.

(29) $47 \times 48 =$ _____.

*(30) $(31)^3 =$ _____ (Integer).

(31) $73_8 =$ _____ 2.

(32) $1.\overline{36} =$ _____ (fraction).

(33) If A = 2, B = 3 and C = -4, then $(AB)^2 \div C =$ _____.

(34) How many proper subsets does a 4 element set have? _____.

(35) $\sqrt{48400} =$ _____.

(36) If a = 5 and b = 2, then $a^3 - 3a^2b + 3ab^2 - b^3 =$ _____.

(37) The area of an isosceles right triangle with hypotenuse $12\sqrt{2}$ is _____.

(38) If n(A) = 3 and n(B) = 4, then n(A x B) = _____.

(39) Find y, if $2x + y = 2$ and $x - y = 1$. _____.

*(40) $35^2 + 2(35)(25) + 25^2 =$ _____ (Integer).

(41) If $4^x = 15.6$, then $4^{x-1} =$ _____.

(42) A regular dodecahedron has _____ congruent pentagonal regions.

(43) Find x, if $2^x 7^x = 1/196$. _____.

(44) If B holds 10% more than A and C holds 20% more than A, then C holds what percent more than B? _____ percent.

(45) If $x^2 + 40^2 = 41^2$, then $x^2 =$ _____.

(46) If 53 and 43 are in base 7, find the remainder when their sum is divided by 6. _____.

(47) The sum of the squares of the roots of $x^2 + 5x - 7 = 0$ is _____.

(48) The conjugate of $-3 + 2i$ is _____.

(49) The number of sides of a regular polygon with an interior angle of 140° is _____.

*(50) $[\ .\overline{12} \times 3300\ ]^2 =$ _____ (Integer).

(51) $6! =$ _____.

(52) The coefficient of the x^3y^3 term in the expansion of $(2x + y)^6$ is _____.

(53) $1 + 3 + 5 + \ldots + 29 =$ _____.

(54) 16 ft/sec = _____ ft/min.

(55) If $x^2 + 3 > 7$, $x > 0$, then $x >$ _____.

(56) Find x, if $\log_4 (4x + 1) = 2$. _____.

(57) The sum of the coefficients in the expansion of $(4x - y)^5$ is _____.

(58) If ${}_5C_3 = {}_5C_x$, $x \neq 3$, then $x =$ _____.

(59) The distance between $y = 3$ and the origin is _____.

*(60) $142857 \times 46 =$ _____ (Integer).

(61) How many ways can six people be seated around a circular table? _____.

(62) $[\ \sqrt{5}\ ] =$ _____.

(63) How many 3-member committees can be formed from a group of 6 people? _____.

(64) If $f(x) = 2x - 5$ and $g(x) = 4$, find $f[g(5)]$. _____.

(65) $12 + 9 + 27/4 + 81/16 + \ldots =$ _____.

(66) $\text{Log}\ (25/3) = \log 25 - \log$ _____.

(67) How mant 4-digit numbers end with a prime number? _____.

(68) The area of the ellipse $x^2/9 + y^2/4 = 1$ is $a\pi$ and $a =$ _____.

(69) Two dice are tossed. What is the probability that the sum of the faces is 5? _____.

*(70) $215 \times 215 - 215 \times 15 =$ _____ (Integer).

(71) The horizontal asymptote for $y = 2^x + 1$ is $y =$ _____.

(72) $(2, 3\pi/2)$ are polar coordinates for (x,y). $x =$ _____.

(73) $.32_4 =$ _____ $_8$ (decimal).

(74) Find x, $0 \leq x < 6$, such that $4x \equiv 22 \pmod 5$. _____.

(75) The remainder when $f(x) = 2x^3 - 4x + 5$ is divided by $x + 2$ is _____.

(76) 86° F = _____ ° C.

(77) $F(x) = 2x^4 + (x - 3)^2$, find $F''(x)$. _____.

(78) $\lim_{x \to 4} \dfrac{x^3 - 2x^2 - 32}{x - 4} =$ _____.

(79) $\int_1^4 x^3\,dx =$ _____.

*(80) $\int_{10}^{13} 2x^2\,dx =$ _____ (Integer).