The University Interscholastic League
Number Sense Test, Series YY - A

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) $1992 + 2991 =$ _____.

(2) $792 - 297 =$ _____.

(3) $21\frac{1}{3}\% =$ _____ (fraction).

(4) $36 \times 4 \div 9 - 3 =$ _____.

(5) $37^2 =$ _____.

(6) $4 \times 10^3 - 452 =$ _____.

(7) $13 \times 37 + 13 \times 43 =$ _____.

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

(9) $74 \times 86 =$ _____.

*(10) $205 + 149 \times 151 =$ _____.

(11) If a 12 oz. package of candy sells for $1.35, what will two pounds cost? $ _____.

(12) Which is larger, $\frac{-4}{5}$ or $\frac{7}{-9}$? _____.

(13) $12 \times 134 =$ _____.

(14) $(94 + 145) \div 3$ has a remainder of _____.

(15) The mean of 31, 26, and 48 is _____.

(16) What is the largest value of x, such that 180 is the LCM of 36, 60 and 6x? _____.

(17) $(2^3 \times 3^2 \times 5^2) \div (2^2 \times 3) =$ _____ (numeral).

(18) The GCD of 21 and 91 is _____.

(19) CXV = _____ (Arabic numeral).

*(20) $58555 \div 239 =$ _____.

(21) Find the simple interest on $2560.00 at $6\frac{1}{4}\%$ for six months. $ _____.

(22) $8\frac{1}{2} \times 34 =$ _____.

(23) The smallest root of $x^2 - x - 42 = 0$ is _____.

(24) Find the smallest prime p, $p > 0$, such that $7p + 4$ is a prime number. _____.

(25) $\sqrt{(72)(18)} =$ _____.

(26) $.363636... =$ _____ (fraction).

(27) If $\frac{x}{4} = \frac{16}{x}$, $x < 0$, then $x =$ _____.

(28) How many integers between 7 and 49 are divisible by 6? _____.

(29) $56_8 =$ _____ 10-

*(30) $49 \times 50 \times 51 =$ _____.

(31) $4\frac{1}{4} \times 4\frac{3}{4} =$ _____ (mixed number).

(32) $45_6 =$ _____ 7-

(33) Find the area of a square if its perimeter is 28. _____.

(34) The product of the roots of $3x^2 - x + 6 = 0$ is _____.

(35) If the area of a rhombus is 135 and one diagonal is 18, the other diagonal is _____.

(36) $12\frac{1}{2} \times 6\frac{1}{2} =$ _____ (mixed number).

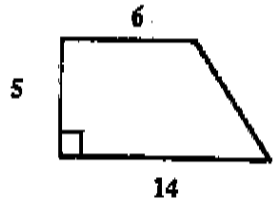
(37) The next term in the sequence 1, 5, 6, 11, 17, 28, ... is _____.

(38) 1101_2 = _____ 4.

(39) How many positive integers less than 38 are relatively prime to 38? _____.

*(40) 49 x 129 + 129 x 61 = _____.

(41) Find the area of the trapezoid. _____.



(42) $(48)^{3/2} = a\sqrt{b}$ and b = _____.

(43) 42 x 62 = _____.

(44) The smallest value of x such that $|2x + 1| = 15$ is ____.

(45) 98 x 97 = _____.

(46) If a triangle has sides of 4, x, and 6, then $6 \div x >$ ____.

(47) If $2^{x-1} = 4.59$, then 2^x = _____.

(48) A regular n-gon has an exterior angle of measure 12 degrees. n = _____ sides.

(49) 31 x 32 = _____.

*(50) 142857 x 15 = _____.

(51) The distance between the points (5, 7) and (2,3) is ____.

(52) 1 + 2 + 3 + ... + 24 = _____.

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

(54) 110 ft/sec. = _____ mph.

(55) What term of the sequence 2, 5, 8, 11, ... is 305? ____.

(56) 97 x 102 = _____.

(57) The number of terms in the expansion of $[(x + y)^2 (x - y)^2]^3$ is _____.

(58) $\frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \ldots$ = _____.

(59) 87 x 111 = _____.

*(60) 632159 ÷ 1111 = _____.

(61) If secA = 2 and A is in QI, then A = _____ 0.

(62) $\log_3 81$ = _____.

(63) How many 4-digit numbers are odd? _____.

(64) The shortest distance between the line $5x - 12y = 13$ and the point (13,0) is _____.

(65) cos(Arcsin 1/2) = _____.

(66) The probability of drawing a ten from a standard deck of cards is _____.

(67) If $(\log_2 5)(\log_5 x) = 1$ then x = _____.

(68) The number .555... in base 7 is equivalent to what number in base 10? _____.

(69) $(3 + i)^{-1} = a + bi$ and a = _____.

*(70) $(24)^4$ = _____.

(71) How many gallons are in a rectangular box 5" x 4" by 231"? _____ gal.

(72) $102_5 \div 3_5$ = _____ 5.

(73) If $A = [3 \quad 4]$ and $B = \begin{bmatrix} 2 \\ 3 \end{bmatrix}$ then AB = [_____].

(74) Change .33, base 5, to a base 10 decimal. _____.

(75) How many ways can 6 people be seated 3 at a time in 3 chairs that are in a row? _____.

(76) The remainder when $f(x) = x^3 - 3x + 1$ is divided by x + 2 is _____.

(77) .2535353 ... = _____ (fraction).

(78) $\lim_{x \to 2} (x^2 + 4x - 5)$ = _____.

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

*(80) The perimeter of the ellipse $4x^2 + 36y^2 = 144$ is ____.