The University Interscholastic League
Number Sense Test, Series YY-1

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) $1992 + 1993 =$ _____.

(2) $732 - 237 =$ _____.

(3) $\frac{3}{4} \times \frac{8}{27} \times \frac{9}{16} =$ _____ (fraction).

(4) $63 \times 25 =$ _____.

(5) $2\frac{1}{4} \times 8\frac{4}{9} =$ _____.

(6) $13 \times 23 + 13 \times 37 =$ _____.

(7) $503 \div 9 =$ _____ (mixed number).

(8) $5\frac{1}{8} - 1\frac{3}{4} =$ _____ (mixed number).

(9) $12 + 22 + 32 + 42 + 52 =$ _____.

*(10) $101 + 599 \times 402 =$ _____.

(11) $65 =$ _____ (Roman Numeral).

(12) $\frac{5}{8} =$ _____ %.

(13) 3 is what percent of 40? _____ %.

(14) $34^2 =$ _____.

(15) $47 \times 53 =$ _____.

(16) $6 \div 3\frac{1}{3} =$ _____ (decimal).

(17) If 1 gram = .04 oz., then 7 oz. = _____ grams.

(18) $\frac{4}{3}$ of a gallon = _____ cubic inches.

(19) $12 \times 37 =$ _____.

*(20) $38591 \div 149 =$ _____.

(21) The mean of 25, 42, and 38 is _____.

(22) $(48 \times 72) \div (12 \times 24) =$ _____.

(23) $8\frac{1}{2} \times 12\frac{1}{2} =$ _____ (mixed number).

(24) Find the simple interest on \$2400.00 at $5\frac{1}{4}$ % for one year. \$ _____.

(25) $\frac{1}{4}$ is what percent more than $\frac{1}{5}$? _____ %.

(26) The largest integer less than 80 which is relatively prime to 77 is _____.

(27) Which is larger, .715 or $\frac{5}{7}$? _____.

(28) At 5 cu. yd. per load, how many loads of dirt will fill a hole 6' x 12' x 21'? _____ loads.

(29) $(32 \times 6 + 9) \div 6$ has a remainder of _____.

*(30) $259 \times 41 + 259 \times 37 =$ _____.

(31) The smallest root of $x^2 + 12x + 35 = 0$ is _____.

(32) $537 =$ _____ 10.

(33) $F(x) = 4x^2 - 20x + 25$, evaluate F(6). _____.

(34) What number times six and added to four, gives the same result? _____.

(35) $\sqrt{27 \times 75} =$ _____.

(36) If the area of a rhombus is 432 and one diagonal is 24, the other diagonal is _____.

(37) 1101_2 = _____ 4.

(38) How many integers between 7 and 83 are divisible by 7?
_____.

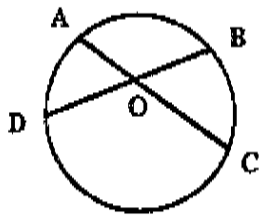
(39) $3\frac{1}{4} \times 7\frac{1}{4}$ = _____ (mixed number).

*(40) 39 x 40 x 41 = _____.

(41) The largest root of $(3x + 1)^2 = \frac{1}{9}$ is _____.

(42) If $3^{x+1} = 12$ then 3^x = _____.

(43) Find DO if AO = 4, BO = 8 and CO = 6. DO = _____.



(44) Evaluate $3xy^{1/2}$ if x = 4 and y = 16. _____.

(45) A circle has an area of 20π sq. in. Its diameter is _____ inches.

(46) The next term of the sequence 3, 6, 4, 7, 5, 8, ... is ___.

(47) 32 x 72 = _____.

(48) The largest value of x such that $|3x - 5| = 22$ is _____.

(49) A regular n-gon has an exterior angle of measure 15 degrees. n = _____ sides.

*(50) 142857 x 21 = _____.

(51) The x-intercept farthest to the right for $f(x) = 3x^2 - 14x - 5$ is x = _____.

(52) 97 x 98 = _____.

(53) The vertex of the parabola $y = x^2 - 6x$ is (h,k) and k = _____.

(54) 98 x 103 = _____.

(55) The product of the GCD and LCM of 24 and 17 is ___.

(56) If $\log_a 6 = .4$ then $\log_a 36$ = _____.

(57) $\frac{2}{5} + \frac{2}{25} + \frac{2}{125} + \ldots$ = _____.

(58) $\frac{\pi}{9}$ radians = _____ degrees.

(59) 92 x 111 = _____.

*(60) 141097 ÷ 1111 = _____.

(61) Find x if $\log_5 (3x-5) = 2$. _____.

(62) $(2 - 3i)^2 = a + bi$ and a = _____.

(63) If cscB = 2 and B is in Q I, then B = _____ 0.

(64) How many 3-digit numbers end in a 3, 5 or 9? _____.

(65) The shortest distance between the line $6x + 8y = 10$ and the point (10,0) is _____.

(66) $\sin(\text{Arcsin}\frac{2}{3})$ = _____.

(67) The probability of rolling a sum of 10 with two dice is _____.

(68) The simplified sum of the coefficients of $(7x - 1)^3$ is _____.

(69) 1.232323... = _____ (improper fraction).

*(70) π^5 = _____.

(71) How many gallons are in a rectangular box 7" x 9" x 231"? _____ gallons.

(72) $204_7 + 6_7$ = _____ 7.

(73) Change .42 base 5, to a base ten decimal. _____.

(74) $f(x) = 4x + 5$, $f^{-1}(x)$ = _____.

(75) Find x, $0 \le x \le 6$, if $5x + 7 \equiv 1 \pmod 7$. _____.

(76) $\det \begin{vmatrix} 1 & 7 \\ 8 & 3 \end{vmatrix}$ = _____.

(77) $\lim_{x \to 3} (x^2 + 2x + 1)$ = _____.

(78) If $f(x) = 3x^2 + 2x$ then $f'(-2)$ = _____.

(79) $\int_0^1 (x^2 + x)\, dx$ = _____.

*(80) $(21)^4$ = _____.