The University Interscholastic League

Number Sense Test, Series 9344

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) $1994 + 499 + 49 =$ _____.

(2) $75 \times 62 =$ _____.

(3) $3008 \div 16 =$ _____.

(4) $12\frac{1}{2}\% =$ _____ (fraction).

(5) $11 \times 437 =$ _____.

(6) $42^2 =$ _____.

(7) $14 \times .09 =$ _____.

(8) $120 =$ _____ (Roman Numeral).

(9) $623 \div 9 =$ _____ (Mixed Number).

*(10) $1447 + 2113 - 543 + 91 =$ _____.

(11) The GCD of 68 and 74 is _____.

(12) $38 \div 26 \times 39 + 2 =$ _____.

(13) $8 - 11 + 14 - 17 + 20 - 23 =$ _____.

(14) $4754 - 5447 =$ _____.

(15) 12% of 350 is _____ % of 200.

(16) $16 \times 23 =$ _____.

(17) $\frac{2}{3} + \frac{5}{7} =$ _____ (Improper fraction).

(18) $33^2 - 27^2 =$ _____.

(19) Find the cost of driving a car 118 miles at $.25 per mile.
$ _____.

*(20) $121 \times 39 + 122 \times 40 =$ _____.

(21) 22 is what percent more than 16? _____%.

(22) $2\frac{1}{2}$ square feet = _____ square inches.

(23) The number of positive integral divisors of 39 is _____.

(24) $14\frac{1}{4} \times 14\frac{3}{4} =$ _____ (Mixed Number).

(25) How many seconds are in 3 hours 19 minutes? _____.

(26) Evaluate F(4.3) if $F(x) = x^2 - 6x + 9$. _____.

(27) Find the smallest prime p, $p > 0$ such that $3p - 2$ is also a prime number. _____.

(28) $(14 + 7 \times 6) \div 5$ has a remainder of _____.

(29) $15 \times 384 =$ _____.

*(30) $69459 \div 411 =$ _____.

(31) Find x if $y - 3 = 7$ and $\frac{1}{x} = y + 5$. _____.

(32) $111 \times 203 =$ _____.

(33) The reciprocal of $(5/7)^{-1}$ is _____.

(34) $(.875 \times 280)^2 =$ _____.

(35) $3^3 - 1 =$ _____ (base 4).

(36) $.515151\ldots =$ _____ (fraction).

(37) The product of the roots of $6x^3 - 4x^2 + 8x + 10 = 0$ is _____ .

(38) If $|2x + 6| \leq 4$ then the smallest value of x is _____ .

(39) If $3^x + 3 = 30$ then x = _____ .

*(40) $17^5 \div 17^4 \times 58$ = _____ .

(41) Find k, so that 2k6 is the smallest 3-digit number divisible by 6. _____ .

(42) $31_6 + 45_6$ = _____ 6.

(43) What number times 3 and 7 less than twice the number, gives the same result? _____ .

(44) The sum of the GCD and LCM of 36 and 24 is _____ .

(45) 44 ft/sec = _____ mph.

(46) How many real roots does $x^4 - 1 = 0$ have? _____ .

(47) 107×108 = _____ .

(48) If $1 - 3x < 16$ then x > _____ .

(49) The distance between the points (3,4) and (9,5) is $\sqrt{k}$ and k = _____ .

*(50) $\sqrt{10560} - \sqrt{566}$ = _____ .

(51) How many integers between 5 and 34 are relatively prime to 34? _____ .

(52) $(a + 2i)^2 = 21 + 20i$ and a = _____ .

(53) A triangle has integral sides of x, 16 and 2x. The smallest value of x is _____ .

(54) The largest palindrome less than 846 is _____ .

(55) $(2 + 3i) \div 2i = a + bi$ and b = _____ .

(56) If $\sqrt{4x + 5} = 7$ then x = _____ .

(57) The area of a 30° - 60° right triangle with hypotenuse 7 is _____ square units.

(58) The remainder, in base 7, when 334 is divided by 7 is _____ .

(59) The sum of the coefficients in the expansion of $(2x - 5)^5$ is _____ .

*(60) 31^4 = _____ .

(61) If $3 < x < 8$ then $x^2 + 1 <$ _____ .

(62) The next term of 3, 7, 16, 35, 74 . . . is _____ .

(63) If sinA = .4, A ∈ QII, then 2A is in quadrant _____ .

(64) The twelfth pentagonal number is _____ .

(65) y varies inversely as x. If x = 5 when y = 4, find x when y = .2. x = _____ .

(66) If cosA = .3 then secA = _____ .

(67) Two dice are rolled. What is the probability that the sum is greater than 7? _____

(68) $\ln e^2$ = _____ .

(69) If the perimeter of an equilateral triangle increases from 6" to 15", its area is multiplied by _____ .

*(70) $(1 + 3 + 5 + \ldots + 11)^2$ = _____ .

(71) $\left(\frac{1}{\sqrt{6}}\right)^4 - \left(\frac{1}{\sqrt{7}}\right)^4$ = _____ .

(72) The area of the ellipse $3x^2 + y^2 = 9$ is kπ and k = _____ _____ .

(73) .1020202 . . . = _____ (fraction).

(74) [x] denotes the greatest integer less than or equal to x. [e] = _____ .

(75) $(212_6) \div (5_6)$ = _____ 6.

(76) Find x, $0 \leq x \leq 12$, if $3x - 2 \equiv 5 \pmod{13}$. _____ .

(77) The minimum value of $y = 3x^2 + 4x$ is _____ .

(78) sin(.0002) = _____ .

(79) $\int_0^{14} (13 - x)\,dx$ = _____ .

*(80) $(\pi^2)(e^2)$ = _____ .