The University Interscholastic League

Number Sense Test, Series ZZ-2

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) $1993 + 193 + 39 =$ _____.

(2) $25 \times 53 =$ _____.

(3) $7(5) + 7(13) + 7(22) =$ _____.

(4) $6 + 12345 \times 9 =$ _____.

(5) $420 \div 9 =$ _____ (Mixed Number).

(6) $37^2 =$ _____.

(7) 16 is _____ % of 400.

(8) Write 52 in Roman Numerals. _____.

(9) $\frac{7}{8} =$ _____ %.

*(10) $48 + 71 \times 329 =$ _____.

(11) $631 - 136 =$ _____.

(12) $64 \div 8 + 7 \times 12 =$ _____.

(13) The largest prime divisor of 171 is _____.

(14) $75 \times .54 =$ _____.

(15) The GCD of 27 and 42 is _____.

(16) $6\frac{2}{3} + \frac{5}{6} =$ _____.

(17) If 1 gram = .04 oz., 600 grams = _____ lbs.

(18) $\frac{29}{(2^3)(5)} =$ _____ (decimal).

(19) $11 \times 374 =$ _____.

*(20) $24442 \div 68 =$ _____.

(21) $2 + 4 + 6 + 8 + \ldots + 58 =$ _____.

(22) The LCM of 24, 60 and 48 is _____.

(23) The simple interest on $650.00 at 3% for 6 months is $ _____.

(24) $77 \times 73 =$ _____.

(25) The sum of three consecutive integers is 192. The smallest integer is _____.

(26) $(4 \times 9 + 3) \div 7$ has a remainder of _____.

(27) The largest root of $6x^2 - 7x - 3 = 0$ is _____.

(28) $5\frac{1}{4} \times 3\frac{1}{4} =$ _____ (Mixed Number).

(29) The number of positive integral divisors of 30 is _____.

*(30) $\sqrt{327} + \sqrt{1027} =$ _____.

(31) $.515151 \ldots =$ _____ (fraction).

(32) Divide 42 into 2 parts such that the larger number exceeds the smaller number by 16. Find the smaller number. _____.

(33) $467 =$ _____ 10.

(34) A square has a perimeter of 48 and its diagonal is _____.

(35) $\sqrt{\sqrt{256}} =$ _____.

(36) $12 \times 232 =$ _____.

(37) Find x if $3x + y = 6$ and $x - y = 10$. $x =$ _____.

(38) $(\sqrt{25} - \sqrt{49})^3 =$ _____.

(39) Find the digit $B > 0$, such that $1568B6 = [3(131 + B)]^2$. $B =$ _____.

*(40) $43 \times 22 - 1800 =$ _____ .

(41) If $y = -3$ then $2y^2 - 4y - 11 =$ _____ .

(42) $2402 \div 9 =$ _____ (Mixed Number).

(43) The sum of the prime divisors of 26 is _____ .

(44) If $5^{x+3} = 125$ then $x =$ _____ .

(45) $999^2 =$ _____ .

(46) $\frac{3}{4}$ mile = _____ feet.

(47) $(13_5)(4_5) =$ _____ $_5$.

(48) $104 \times 102 =$ _____ .

(49) The next term of the sequence 2, 5, 11, 23, 47, . . . is _____ .

*(50) $\sqrt{186600} =$ _____ .

(51) If a triangle has sides of 4, 8 and x then $x + 3 >$ _____ .

(52) $11011_2 =$ _____ $_4$.

(53) The graph of a polynomial of degree 4, can have at most, how many turning points? _____ .

(54) $\ln e^4 =$ _____ .

(55) $(1 - 2i)(3 - 4i) = a + bi$ and $a =$ _____ .

(56) $32 + 16 + 8 + 4 + \ldots =$ _____ .

(57) The probability of drawing a jack or queen from a standard deck of cards is _____ .

(58) The fifteenth triangular number is _____ .

(59) $39 \times 61 + 61 \times 72 =$ _____ .

*(60) $(40 \times 140)^2 \div (39 \times 70) =$ _____ .

(61) $\frac{3 - i}{i} = a + bi$ and $b =$ _____ .

(62) If $\cos A = .25$ and A is in QIV then $\sin A =$ _____ .

(63) If $x^2 + y^2 = 73$, $x > y$ and they are positive integers, then $y =$ _____ .

(64) If $x + \log_3 27 = 7$ then $x =$ _____ .

(65) If $x < 0$ and $|3x + 6| = 9$ then $x =$ _____ .

(66) The vertex of the parabola $y = 4x^2 + 8x + 5$ is (h,k) and $h =$ _____ .

(67) The expansion of $(2x - y^2)^5$ has _____ terms.

(68) If $14^5 \div 49 = (2^x)(7^y)$, x and y are integers, then $y =$ _____ .

(69) True or False: If B is in QI then cosB can equal 1.2? _____ .

*(70) $142857 \times 43 =$ _____ .

(71) $f(x) = x^3 + 3x - 1$, find $[f(3)]^2$. _____ .

(72) Change .14, base 7, to a base 10 fraction. _____ .

(73) The vertical asymptote farthest to the left on the graph of $y = \frac{x + 5}{x^2 - 9}$ is $x =$ _____ .

(74) How many 4-digit numbers end in a 6 or 4? _____ .

(75) If $x^2 + 9$ is divided by $x + 1$, then the remainder is _____ .

(76) $\lim_{x \to \infty} \frac{3x + 1}{x^2 - 2} =$ _____ .

(77) If $f(x) = 4x^2 + 3x$ then $f''(2) =$ _____ .

(78) $\lim_{x \to 4} \frac{x^2 - 16}{2x - 8} =$ _____ .

(79) $\int_0^6 (6 - x)\,dx =$ _____ .

*(80) $(45)^4 =$ _____ .