

The University Interscholastic League

Number Sense Test, Series ZZ-1

Contestant's Number _____

Contestant's Score _____

Read Directions Carefully
Before Beginning TestDo 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) $1993 - 993 - 93 =$ _____
- (2) $8(13) + 8(5) + 8(7) =$ _____
- (3) $47 \times 25 =$ _____
- (4) $321 \div 9 =$ _____ (Mixed Number).
- (5) $5 + 1234 \times 9 =$ _____
- (6) $\frac{5}{8} =$ _____ %.
- (7) Write 51 in Roman Numerals. _____
- (8) $43^2 =$ _____
- (9) 12 is _____ % of 300.
- *(10) $79 + 81 \times 239 =$ _____
- (11) If 1 gram = .04 oz., 800 grams = _____ lbs.
- (12) The GCD of 28 and 63 is _____
- (13) $.42 \times 75 =$ _____
- (14) The largest prime divisor of 117 is _____
- (15) $42 \div 6 + 9 \times 12 =$ _____
- (16) $712 - 217 =$ _____
- (17) $7\frac{1}{2} \div \frac{3}{4} =$ _____
- (18) $11 \times 459 =$ _____
- (19) $\frac{21}{2(5^3)} =$ _____ (decimal).
- *(20) $42244 \div 87 =$ _____
- (21) $83 \times 87 =$ _____
- (22) $1 + 3 + 5 + \dots + 59 =$ _____
- (23) The simple interest on \$450.00 at 3% for 6 months is \$ _____
- (24) The LCM of 21, 49, and 42 is _____
- (25) The sum of three consecutive integers is 156. The largest integer is _____
- (26) $(3 \times 8 + 5) \div 6$ has a remainder of _____
- (27) The number of positive integral divisors of 24 is _____
- (28) The smallest root of $6x^2 + x - 1 = 0$ is _____
- (29) $6\frac{1}{3} \times 9\frac{1}{3} =$ _____ (Mixed Number).
- *(30) $\sqrt{295} + \sqrt{1021} =$ _____
- (31) Divide 38 into 2 parts such that the larger number exceeds the smaller number by 14. Find the smaller number. _____
- (32) $.696969\dots =$ _____ (fraction).
- (33) A square has a perimeter of 36 and its diagonal is _____
- (34) $458 =$ _____ 10.
- (35) $\sqrt{\sqrt{81}} =$ _____
- (36) Find x if $2x - y = 7$ and $x + y = 5$. $x =$ _____
- (37) $12 \times 121 =$ _____
- (38) Find the digit $B > 0$, such that $547B6 = [2(122 - B)]^2$. $B =$ _____
- (39) $(\sqrt{16} - \sqrt{36})^3 =$ _____

- *(40) $31 \times 22 - 1600 =$ _____
- (41) If $x = -2$ then $3x^2 - 2x - 5 =$ _____
- (42) The product of the prime divisors of 28 is _____
- (43) If $4^{x+2} = 64$ then $x =$ _____
- (44) $\frac{2}{3}$ mile = _____ feet.
- (45) $994^2 =$ _____
- (46) $(124)(34) =$ _____ 4
- (47) $2221 \div 9 =$ _____ (Mixed Number).
- (48) $103 \times 102 =$ _____
- (49) The next term of the sequence 2, 6, 14, 30, 62, ... is _____
- *(50) $\sqrt{168200} =$ _____
- (51) If a triangle has sides of 5, 9 and x then $x + 2 >$ _____
- (52) $10111_2 =$ _____ 4
- (53) The graph of a polynomial of degree 3, can have at most how many turning points? _____
- (54) $40 + 20 + 10 + 5 + \dots =$ _____
- (55) $\ln e^3 =$ _____
- (56) $(2 + 3i)(2 - 4i) = a + bi$ and $a =$ _____
- (57) The probability of drawing a king or queen from a standard deck of cards is _____
- (58) The thirteenth triangular number is _____
- (59) $37 \times 51 + 51 \times 74 =$ _____
- *(60) $(130 \times 30)^2 \div (29 \times 65) =$ _____
- (61) If $\log_4 16 + x = 5$, then $x =$ _____
- (62) If $x^2 + y^2 = 53$, $x > y$ and they are positive integers, then $y =$ _____
- (63) $\frac{2+i}{i} = a + bi$ and $b =$ _____
- (64) If $\cos A = .5$, and A is in QIV then $\sin A =$ _____
- (65) The expansion of $(x - 3y^2)^4$ has _____ terms.
- (66) If $x < 0$ and $|2x + 5| = 7$ then $x =$ _____
- (67) The vertex of the parabola $y = 3x^2 + 6x + 1$ is (h, k) and $h =$ _____
- (68) If $14^4 \div 4 = (2^x)(7^y)$, x and y are integers, then $x =$ _____
- (69) True or False: If B is in QI then $\sin B$ can equal 1.4? _____
- *(70) $142857 \times 39 =$ _____
- (71) Change .13, base 7, to a base 10 fraction. _____
- (72) $f(x) = x^3 + 2x + 1$, find $[f(3)]^2$. _____
- (73) The vertical asymptote farthest to the right on the graph of $y = \frac{x+3}{x^2-4}$ is $x =$ _____
- (74) How many 4-digit numbers end in a 3 or 5? _____
- (75) If $x^2 + 4$ is divided by $x + 1$ then the remainder is _____
- (76) $\lim_{x \rightarrow \infty} \frac{2x-5}{x^2+1} =$ _____
- (77) If $f(x) = 3x^2 + 6x$ then $f^{-1}(2) =$ _____
- (78) $\lim_{x \rightarrow 3} \frac{x^2-9}{2x-6} =$ _____
- (79) $\int_0^5 (5-x) dx =$ _____
- *(80) $(35)^4 =$ _____