The University Interscholastic League
Number Sense Test, Series 934-SAC

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) $3991 - 1993 =$ _____ .

(2) $1993 + 3 \times 1993 =$ _____ .

(3) $25 \times 194 =$ _____ .

(4) $2004 \div 6 =$ _____ .

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

(6) $8 + 48 \div 4 \times 2 =$ _____ .

(7) $16\frac{1}{5}\% =$ _____ (decimal).

(8) Which is smaller $\frac{3}{13}$ or $\frac{4}{17}$? _____ .

(9) $3\frac{1}{4} - 2\frac{5}{8} =$ _____ (fraction).

*(10) $803 \times 649 =$ _____ .

(11) The GCD of 28 and 52 is _____ .

(12) $29^2 =$ _____ .

(13) $26 \times 34 =$ _____ .

(14) $113 =$ _____ (Roman Numeral).

(15) $15 \times 37 + 43 \times 15 =$ _____ .

(16) $6\frac{3}{7}\% =$ _____ (fraction).

(17) The mean of 13 and 49 is _____ .

(18) $2 + 4 + 6 + 8 + \ldots + 20 =$ _____ .

(19) $12 \times 23 =$ _____ .

*(20) $24265 \div 211 =$ _____

(21) $12\frac{1}{4} \times 8\frac{1}{4}$ _____ (mixed number).

(22) The LCM of 12 and 14 is _____ .

(23) The number of positive integral divisors of 24 is _____ .

(24) $3\frac{1}{2}$ is what percent of 20? _____ %.

(25) The largest prime number less than 29 is _____ .

(26) Evaluate F(4) if $F(x) = x^2 + 6x + 9$. _____ .

(27) A team won $\frac{15}{17}$ of its 136 games. How many did it win? _____ .

(28) $1995 \div 9$ has a remainder of _____ .

(29) $312_4 =$ _____ 10.

*(30) $\sqrt{574} + \sqrt{119} =$ _____ .

(31) If 6 pencils cost 68 cents, then one dozen cost $ _____ .

(32) $.272727 \ldots =$ _____ (fraction).

(33) What number times 4 and added to 5 gives the same result? _____ .

(34) $\sqrt{60 \times 135} =$ _____ .

(35) $111 \times 43 =$ _____ .

(36) If $x + y = 11$ and $2x - y = 13$ then $y =$ _____ .

(37) $(49 - 2 \times 7 + 4) \div 6$ has a remainder of _____.

(38) $39^2 - 36^2 =$ _____.

(39) How many integers between 9 and 63 are divisible by 7? _____.

*(40) $16 \times 49 + 50 \times 26 =$ _____.

(41) $1011_2 =$ _____ 4.

(42) If $4^{x+1} = 111.4$ then $4^x =$ _____.

(43) The sum of the GCD and LCM of 20 and 35 is _____.

(44) The sum of the roots of $3x^2 - 7x + 2 = 0$ is _____.

(45) $98 \times 97 =$ _____.

(46) The number halfway between 23 and 49 is _____.

(47) $15 \times 42 =$ _____

(48) The largest palindrome less than 300 is _____.

(49) If $2x - 1 < 19$ then $x <$ _____.

*(50) $(19)^4 =$ _____.

(51) What is the largest divisor of 120 which is less than 40 ? _____.

(52) The orthocenter of a triangle is the point of intersection of _____ altitudes of a triangle.

(53) The next term of 1, 5, 12, 22, ... is _____.

(54) $14^3 - 13^3 =$ _____.

(55) $\text{Log}_6 216 =$ _____.

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

(57) $(3 + 7i)^2 = a + bi$ and $b =$ _____.

(58) There are _____ Platonic solids.

(59) If log 3 = .4771 then log 27 = _____.

*(60) $\sqrt{2240000} =$ _____

(61) $2^{-1} + 3^{-1} =$ _____.

(62) The area of the ellipse $3x^2 + 9y^2 = 27$ is $k\pi$ and $k =$ _____.

(63) Tan $60^\circ =$ _____.

(64) $\frac{3\pi}{5}$ radians = _____ degrees.

(65) Two dice are rolled. What is the probability that the sum of the numbers is greater 10? _____.

(66) Find x, if $\log_4(2x - 8) = 2$ _____.

(67) The sum of the coefficients of $(x - y)^5$ is _____.

(68) How many 4-digit numbers are there? _____.

(69) The third pentagonal number is _____.

*(70) $27 \times 142857 =$ _____.

(71) $(8, \frac{2\pi}{3})$ are polar coordinates for (x,y). y = _____.

(72) Sin(Arccos - .5) = _____.

(73) Change .35, base 7, to a base 10 fraction _____.

(74) Find x, $0 \le x \le 10$, if $2x + 3 \equiv 8 \pmod{11}$._____.

(75) If $f(x) = x^2 + x + 1$, find f[f(1)]._____.

(76) $(133)_6 \div (3_6) =$ _____ 6.

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

(78) $f(x) = x^2$, $x \ge 0$, find $f^{-1}(x) =$ _____.

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

*(80) $(1 + 2 + 3 + ... + 9)^2 =$ _____.