The University Interscholastic League
Number Sense Test, Series 9568

Final _____ ____
2nd _____ ____
1st _____ ____
Score Initials

Contestant's Number _____

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) $\frac{6}{8} \times \frac{30}{3} \times \frac{10}{9} =$ _____.

(2) $1996 + 996 + 96 =$ _____.

(3) $483 \div 9 =$ _____ (Mixed Number).

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

(5) $11 \times 73 =$ _____.

(6) Write 155 in Roman Numerals. _____.

(7) $4567 + 7654 =$ _____.

(8) $38^2 =$ _____.

(9) $9 \times 4321 - 1 =$ _____

*(10) $2919 + 4309 + 318 =$ _____.

(11) Which is smaller, $\frac{11}{13}$ or $\frac{5}{7}$? _____.

(12) $45 \div 1\frac{4}{5} =$ _____.

(13) $2\frac{1}{3}$ yards = _____ inches.

(14) $\frac{1}{16} =$ _____% (Mixed Number).

(15) $48 \div 12 + 4 \times 2 =$ _____.

(16) The smallest positive prime divisor of 91 is _____.

(17) $15 \times 48 =$ _____.

(18) $12^2 + 24^2 =$ _____

(19) If 3 pencils cost 59 cents then two dozen pencils cost $ _____.

*(20) $219 \times 50 + 220 \times 49 =$ _____.

(21) The average of 12, 24, 20 and 72 is _____.

(22) $12 \times 81 =$ _____.

(23) The simple interest on $900.00 at 6.4% interest for two years is $ _____.

(24) $2 + 4 + 6 + 8 + \ldots + 22 =$ _____.

(25) Divide 61 into 2 parts such that the larger number exceeds the smaller number by 17. Find the larger number. ____.

(26) $32 \times 38 =$ _____.

(27) $(29 \times 6 + 16) \div 7$ has a remainder of _____.

(28) $134_6 =$ _____ 10

(29) If $A = 6$, $B = -4$ and $C = 3$ then $B^2C \div A =$ _____.

*(30) $\sqrt{152000} =$ _____.

(31) The sum of the positive prime divisors of 140 is _____.

(32) $14\frac{1}{2}$ is what percent less than 20? _____% (Mixed Number).

(33) If $12^n = 1728$ then n = _____.

(34) Evaluate F(–3) if $F(x) = x^2 - 10x + 25$. _____.

(35) The GCD of 24, 72 and 40 is _____.

(36) The sum of the positive integral divisors of 30 is _____.

(37) $6\frac{1}{3} \times 12\frac{1}{3} =$ _____ (Mixed Number).

(38) 3.232323... = _____ (Mixed Number).

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

*(40) 131 x 169 + 1329 = _____.

(41) If x = 3 and y = –3 then $4x^2 - 4xy + y^2 =$ _____.

(42) 1 gallon = _____ ounces.

(43) The absolute value of 2x – 5 is 17. The largest value of x is _____.

(44) 1 square mile = _____ acres.

(45) Find x if $y = \frac{x+3}{4}$ and y = –7. _____.

(46) The next term of the sequence 4,7,5,8,6,9,... is _____.

(47) $43^2 - 41^2 =$ _____.

(48) If $3^x = 9.12$ then $3^{x-1} =$ _____.

(49) The distance between the points (3,4) and (–2, 16) is _____.

*(50) How many minutes in two days? _____.

(51) A right triangle has integral sides. If one leg is 13 then the length of the other leg is _____.

(52) 92 x 95 = _____.

(53) If a triangle has sides of 7, 11 and x then x + 9 > _____.

(54) 111 x 42 = _____.

(55) (3 + 5i) (5 – 3i) = a + bi and a = _____.

(56) $55^2 + 45^2 =$ _____.

(57) sin 150° = _____.

(58) 6327 ÷ 111 = _____.

(59) The largest integer x such that x + 7 > 2x – 3 is _____.

*(60) 142857 x 27 = _____.

(61) If $\log_x 25 = \log_3 9$ then x = _____.

(62) $1211_3 =$ _____$_9$.

(63) The vertex of the parabola $y = x^2 - 3x + 4$ is (h,k) and h = _____.

(64) If f(x) = x + 2, find $f[f^{-1}(2)]$. _____.

(65) Find x if $\det\begin{vmatrix} x & 2 \\ x & 4 \end{vmatrix} = 8$, x = _____.

(66) $\frac{1}{3} - \frac{1}{6} + \frac{1}{12} - \ldots =$ _____.

(67) Find the number of proper fractions in lowest terms with a denominator of 13. _____.

(68) sin (Arccos $\sqrt{3}/2$) = _____.

(69) Find k, so that the 3 digit number 7k6 is divisible by 7. _____.

*(70) 38001 ÷ 159 = _____.

(71) Let t_n denote the nth triangular number. Find the value of $t_2 + t_3$. _____.

(72) The simplified sum of the coefficients of $(3x - 4y)^3$ is _____.

(73) Find x, $0 \le x \le 10$, if $2x - 6 \equiv 16 \pmod{11}$. _____.

(74) A box contains 5 red and 7 blue balls. If 2 balls are drawn without replacement, what is the probability that both are blue? _____.

(75) The radius of the inscribed circle of a 6,8,10 right triangle is _____.

(76) $3^{10} \div 4$ has a remainder of _____.

(77) The length of the tangent from (5,0) to the circle $x^2 + y^2 = 9$ is _____.

(78) $\lim_{x \to 0} \cos 2x =$ _____.

(79) $\int_0^3 (x + 2)\,dx =$ _____.

*(80) $(1 + 3 + 5 + \ldots + 9)^2 =$ _____.