The University Interscholastic League
Number Sense Test, Series WW-4

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) $2103 - 127 + 215$ _____.

(2) $8 \times 46\frac{1}{2} =$ _____.

(3) $235 - 532 =$ _____.

(4) $2.35 \times 10^2 + 79 =$ _____.

(5) $11 \times 89 =$ _____.

(6) $105 \times 105 =$ _____.

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

(8) The largest prime dividsor of 85 is _____.

(9) $506 \div 9 =$ _____ (mixed number).

*(10) $499 \times 698 - 102 =$ _____.

(11) $16 \div 2\frac{1}{2} =$ _____ (improper fraction).

(12) $205 = 13 \times 13 +$ _____.

(13) $4^0 + 2 \times 4 + 4^{-1} =$ _____.

(14) 14% of 1600 is _____.

(15) Which is smaller, $\frac{-3}{7}$ or $\frac{4}{-9}$? _____.

(16) If 3 apples cost 79 cents, then one dozen cost $_____.

(17) $25 \times 15 \times 28 =$ _____.

(18) The product of the GCD and LCM of 12 and 18 is _____.

(19) $\frac{11}{2^{4(5)}} =$ _____ (decimal).

*(20) $75075 \div 231 =$ _____.

(21) $96 \times 97 =$ _____.

(22) If $A = 6$, $B = 2$ and $C = 8$, then $AC \div B^2 =$ _____.

(23) $\frac{2}{3}$ % of 18 is $\frac{3}{4}$ % of _____.

(24) The average of 24, 16 and 17 is _____.

(25) .423423... = _____ (fraction).

(26) If a 9 by 7 picture is decreased to 3 by 7, its area is multiplied by _____.

(27) Change 41, base 7, to base 6. _____.

(28) How many integers between 7 and 32 are divisible by 4. _____.

(29) $1 + 3 + 5 + \ldots + 37 =$ _____.

*(30) $(202 \times 198)^2 \div (198 \times 201) =$ _____.

(31) How many positive integers divide 72? _____.

(32) $111 \times 27 =$ _____.

(33) $(41_5)^2 =$ _____ 10.

(34) $5\frac{3}{4} \times 5\frac{1}{4} =$ _____ (mixed number).

(35) The smaller root of $6x^2 + 5x + 1 = 0$ is _____.

(36) Find y, if $2x = y$ and $x + y = 12$. _____.

(37) If $x = 5$, then $x^4 - 2x^2 + 1 =$ _____.

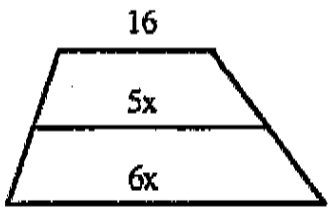
(38) Find the next term of 3,8,15,24,... _____.

(39) $85 \times 114 =$ _____.

*(40) $39 \times 129 + 129 \times 129 =$ _____.

(41) The smaller root of $\sqrt{x^2 - 9} = 4$ is _____.

(42) A trapezoid and its median are shown. Find the value of x. $x =$ _____.



(43) $991 \times 992 =$ _____.

(44) The distance between the point (5,6) and the line $x = 1$ is _____.

(45) If $3^x = 33$, then $3^{x-1} =$ _____.

(46) The side opposite 60° in a right triangle with a hypotenuse 10 is _____.

(47) If $x > 0$, and $x^2 > 4$, then $x - 2 >$ _____.

(48) The hypotenuse of a right triangle is 101 and one leg is 20. The other leg is _____.

(49) $41 \times 42 =$ _____.

*(50) $142857 \times 19 =$ _____.

(51) If $\log 5 = .7$, then $\log 25 =$ _____.

(52) $3 + 1 + \frac{1}{3} + \ldots =$ _____.

(53) Three coins are tossed, what is the probability of getting three tails? _____.

(54) If $\log_2 8 = \log_5 x$, then $x =$ _____.

(55) If two dice are rolled, the probability that the sum is 13 or 7 is _____.

(56) $(a + 7i)^2 = 15 + 112i$ and $a =$ _____.

(57) If 2 a's = 5 b's and b = 4 c's, then a = _____ c's.

(58) $4^6 + 12$ has a remainder of _____.

(59). How many distinguishable permutations can you make using the letters m,a,m,a? _____.

*(60) $\sqrt{806404} =$ _____.

(61) The area of the ellipse $4x^2 + 9y^2 = 36$ is $k\pi$ and $k =$ _____.

(62) $30° C =$ _____ ° F.

(63) $2 \sin 30° \cos 30° =$ _____.

(64) How many different sets of two books can be selected from seven distinct books? _____.

(65) $\sin A = \cos A$, $A < 90°$, $A =$ _____ °.

(66) How many 3-digit numbers are multiples of 5? _____.

(67) $\sin(\text{Arcsin}\frac{3}{5}) =$ _____.

(68) The sum of the coefficients in the expansion of $(3x + 2y)^4$ is _____.

(69) Find x, if $\det \begin{vmatrix} 7 & x \\ 3 & x \end{vmatrix} = 16$. _____.

*(70) $(17)^4 =$ _____.

(71) Find x, $0 \le x \le 4$, $3x + 1 \equiv 2 \pmod 5$. _____.

(72) If $f(5) = 6$, then $f^{-1}(6) =$ _____.

(73) $(154_7) \div (4_7) =$ _____ $_7$.

(74) $\lim_{x \to 5} \frac{x + 1}{x - 1} =$ _____.

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

(76) $f(x) = x^2 + x + 1$, $f'(2)$. _____.

(77) $f(x) = 4x^3$, $f''(x)$. _____.

(78) $\int_2^4 x^2 \, dx =$ _____.

(79) $\lim_{x \to 0} \frac{\sin 2x}{x} =$ _____.

*(80) $21 \times 23 \times 25 \times 27 =$ _____.