The University Interscholastic League
Number Sense Test, Series WW-3

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) $24\% =$ _____ (fraction).

(2) $7(12) + 7(8) + 7(7) =$ _____.

(3) $411 \div 9 =$ _____ (mixed number).

(4) 16 is _____ % of 400.

(5) $56^2 =$ _____.

(6) $12 \times 131 =$ _____.

(7) $\frac{4}{27} \times \frac{9}{7} \times \frac{6}{8} =$ _____.

(8) $1353 \div 11 =$ _____.

(9) XLIII _____ (Arabic Numeral).

*(10) $61 + 61 \times 349 =$ _____.

(11) If 1 gram = .04 oz., 1250 grams = _____ lbs.

(12) $4\frac{1}{5}\%$ of $115 =$ _____.

(13) The largest prime divisor of 91 is _____.

(14) Which is larger, $\frac{4}{-7}$ or $\frac{-5}{8}$? _____.

(15) $14 \div 2 + 3 \times 4 =$ _____.

(16) $.64 \times 75 =$ _____.

(17) $4\frac{1}{3} \div 3\frac{1}{3} =$ _____ (improper fraction).

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

(19) The LCM of 14 and 18 is _____.

*(20) $18 \times 20 \times 22 - 100 =$ _____.

(21) $1 + 3 + 5 + \ldots + 75 =$ _____.

(22) _____ % of 25 is 8% of 400.

(23) $47 \times 63 =$ _____.

(24) The sum of three consecutive integers is 141. The middle number is _____.

(25) $.3888\ldots =$ _____ (fraction).

(26) The simple interest on $800 for 6 months was $28. The rate was _____ %.

(27) $(14 \times 7 + 9) \div 3$ has a remainder of _____.

(28) The sum of the positive integral divisors of 44 is _____.

(29) $12\frac{1}{4} \times 8\frac{1}{4} =$ _____ (mixed number).

*(30) $136061 \div 379 =$ _____.

(31) The next term in the sequence 14,19,17,22,20 is _____.

(32) $39 \times 41 + 41 \times 72 =$ _____.

(33) If a 3 by 5 picture is enlarged to 6 by 5, its area is multiplied by _____.

(34) $(\sqrt{64} - \sqrt{36})^5 =$ _____.

(35) Find x, if $3x + y = 2$ and $x + y = 6$. _____.

(36) $87 \times 112 =$ _____.

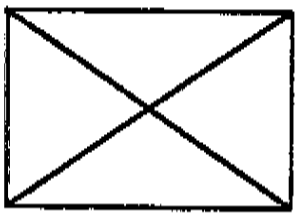
(37) Change 27 base 8 to base 7. _____.

(38) If $x = 4$, then $x^3 - 2x + 1 =$ _____.

(39) How many positive integers are relatively prime to 38? _____.

*(40) $\sqrt{121800} =$ _____.

(41) How many different triangles are shown in the drawing? _____.



(42) $64^{3/2} =$ _____.

(43) The area of an equilateral triangle with a side of 2 is _____.

(44) $992 \times 995 =$ _____.

(45) The distance from (3,4) to (7,8) is _____.

(46) $6216 \div 111 =$ _____.

(47) The largest integer x such that $3x + 1 < 17$ is _____.

(48) $1111_2 =$ _____ 4.

(49) The hypotenuse of a right triangle is 113 and one leg is 15. The other leg is _____.

*(50) $79 \times 23 + 46 \times 23 =$ _____.

(51) $5^6 \div 12$ has a remainder of _____.

(52) If a triangle has sides of 7, 8 and x, then $x + 1 <$ _____.

(53) $\sqrt{-27}\ \sqrt{-3} =$ _____.

(54) How many 5-digit numbers end in a 2 or a 4? _____.

(55) $25 + 5 + 1 + \ldots =$ _____.

(56) Find x, if $\log_2 x + \log_2 x = \log_2 x^3$. _____.

(57) $(a - 6i)^2 = -11 + 60i$ and $a =$ _____.

(58) The probability of drawing a face card from a standard deck of cards is _____.

(59) ${}_4\log_4 3 =$ _____.

*(60) $17 \times 19 \times 21 \times 23 =$ _____.

(61) $\sin 75° = \cos A$, $A < 90°$, $A =$ _____°.

(62) The expansion of $(2x + y)^6$ has _____ terms.

(63) $\cos \frac{3\pi}{4} =$ _____.

(64) The vertex of the parabola $y = x^2 + 6x + 4$ is (a,b) and $b =$ _____.

(65) If $x < 0$ and $|3x + 2| = 2$, then $x =$ _____.

(66) $\cos(\text{Sin}^{-1}\frac{1}{2}) =$ _____.

(67) If ${}_5P_n = 20$, then $n =$ _____.

(68) A triangle has sides of 8 and 9 with an included angle of 120°. The area is _____.

(69) Find x, if $\det \begin{vmatrix} 3 & x \\ 2 & 5 \end{vmatrix} = x$. _____.

*(70) $142857 \times 28 =$ _____.

(71) A is 20% less than B and B is 30% less than C. A is what percent less than C? _____ %.

(72) Change .13, base 5, to a base 10 decimal. _____.

(73) $g(x) = \sqrt{x^2 + 1}$, find $g[g(2)]$. _____.

(74) The horizontal asymptote of $y = \frac{2x^2 + 3x}{3x^2 + 1}$ is _____.

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

(76) $f(x) = x^2 + 3x + 2$, find $f''(x)$. _____.

(77) $f(x) = (3x - 1)^2$, find $f'(x)$. _____.

(78) $\int_1^4 2x\ dx =$ _____.

(79) $\lim_{x \to 0} \frac{\sin x}{3x} =$ _____.

*(80) $(26)^4 =$ _____.