The University Interscholastic League
Number Sense Test, Series WW-2

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) $1354 - 147 + 216 =$ _____.

(2) $\frac{3}{5} \times \frac{8}{14} \times \frac{15}{9} =$ _____.

(3) $57 \times 25 =$ _____.

(4) $310 \div 9 =$ _____ (mixed number).

(5) $43^2 =$ _____.

(6) $\frac{5}{8} =$ _____ %.

(7) $(12 + 24)(8 + 3) =$ _____.

(8) $16.8 \times 10^2 - 43 =$ _____.

(9) 8 is _____ % of 160.

*(10) $61 \times 349 \div 21 =$ _____.

(11) Write 97 in Roman Numerals. _____.

(12) $12(15) + 12(16) =$ _____.

(13) The smallest prime divisor of 187 is _____.

(14) $9\frac{1}{2} \div 2\frac{1}{2} =$ _____ (improper fraction).

(15) The GCD of 72 and 112 is _____.

(16) Which is larger, $\frac{-8}{7}$ or $\frac{9}{-8}$? _____.

(17) $15 \times 54 =$ _____.

(18) $.6 - 6 \div 6 - 3.6 =$ _____.

(19) $\frac{9}{5^2(2^4)} =$ _____ (decimal).

*(20) $67510 \div 259 =$ _____.

(21) 14 % of 110 is 35 % of _____.

(22) $64 \times 56 =$ _____.

(23) $1 + 3 + 5 + \ldots + 31 =$ _____.

(24) How many positive integers divide 45? _____.

(25) If A = 15, B = 7 and C = 8, then AC ÷ B = _____.

(26) $.454545\ldots =$ _____ (fraction).

(27) A car travels 128 miles in $2\frac{2}{3}$ hours. The average speed was _____ mph.

(28) $12\frac{1}{3} \times 6\frac{1}{3} =$ _____ (mixed number).

(29) The simple interest on $925.00 at 8% for 6 months is $ _____.

*(30) $34 \times 57 + 34 \times 53 =$ _____.

(31) The smallest root of $2x^2 + 3x - 2 = 0$ is _____.

(32) $(6 \times 24 + 10) \div 4$ has remainder of _____.

(33) $212_6 =$ _____ 10.

(34) Find x, if $2x - 3 = 4x - 8$. _____.

(35) A square has a perimeter of 28 and its diagonal is _____.

(36) Change 34 base 5 to base 6. _____.

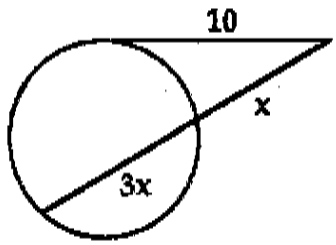
(37) The next term in the sequence 6,11,7,12 is _____.

(38) $92 \times 107 =$ _____.

(39) Find k, if $kx^2 - 20x + 12 = 0$ and the product of the roots is 4. k = _____.

*(40) $49 \times 50 \times 51 - 10^4 =$ _____.

(41) A tangent and a secant line are shown. Find the value of x. x = _____.



(42) If $5^x = 15$, then $5^{x+1} =$ _____.

(43) The measure of an interior angle of a regular hexagon is _____ degrees.

(44) $998 \times 995 =$ _____.

(45) The area of an equilateral triangle with a side of 14 is _____.

(46) If $x > 7$, then $x^2 - 3 >$ _____.

(47) If $\sqrt{3x+1} = 7$, then x = _____.

(48) $152 \times 111 =$ _____.

(49) The hypotenuse of a right triangle is 85 and one leg is 13. The other leg is _____.

*(50) $\sqrt{17161} =$ _____.

(51) $75 + 15 + 3 + \ldots =$ _____.

(52) $\log_{10} 3 - \log_{10} 3000 =$ _____.

(53) $\sqrt{-32}\ \sqrt{-2} =$ _____.

(54) If two dice are rolled, the probability that the sum is 9 or 5 is _____.

(55) How many 5-digit numbers are odd? _____.

(56) The probability of losing is $\frac{5}{13}$. The probability of winning is _____.

(57) If $2 \log_5 x = 1$, then x = _____.

(58) $(a - 3i)^2 = 40 - 42i$ and a = _____.

(59) The coefficient of the x^3y^2 term in the expansion of $(x + 2y)^5$ is _____.

*(60) $15 \times 17 \times 19 \times 21 =$ _____.

(61) If ${}_8C_3 = {}_8C_n$, $n \neq 3$, then n = _____.

(62) How many positive integers are relatively prime to 90? _____.

(63) The volume of a pyramid is 54 and its height is 9. The area of the base is _____.

(64) $\sec 120° =$ _____.

(65) $[x]$ denotes the greatest integer function. $[3.6] =$ _____.

(66) $\text{Cot}^{-1} 1 =$ _____ degrees.

(67) The surface area of a sphere with a radius of 8 is $k\pi$ and k = _____.

(68) Find x, if $\det \begin{vmatrix} 3x & 7 \\ x & 2 \end{vmatrix} = 1$. _____.

(69) $\sin 70° = 2 \sin A \cos A$, $A < 90°$, A = _____°.

*(70) $(29)^4 =$ _____.

(71) $f(x) = x^2 - 1$, find $f[f(4)]$. _____.

(72) Change .32, base 5, to a base 10 fraction. _____.

(73) The remainder when $f(x) = 3x^2 - x + 2$ is divided by $x + 2$ is _____.

(74) $(216_7) \div (3_7) =$ _____ $_7$.

(75) $\lim_{x \to 5} \frac{x^2 - 25}{x - 5} =$ _____.

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

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

(78) $\int_2^3 x^2\ dx =$ _____.

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

*(80) $142857 \times 29 =$ _____.