The University Interscholastic League
Number Sense Test, Series UU-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 only approximate 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) $8759 - 261 \div 13 =$ _____.

(2) $(8 + 3)(45 \div 4) =$ _____.

(3) $11/40 =$ _____ %.

(4) $58 \times 62 =$ _____.

(5) $602 \div 9 =$ _____ (mixed number).

(6) $54^2 =$ _____.

(7) $13 \times 13 \div 13^2 =$ _____.

(8) 2/3 of 6 feet 3 inches = _____ inches.

(9) $3\ 1/4 \div 2\ 1/2 =$ _____.

*(10) $31 \times 251 - 1 =$ _____ (Integer).

(11) $429 \div 11 =$ _____.

(12) The smallest prime divisor of 47 is _____.

(13) _____ is 6 1/4% of 224.

(14) If 1 gram = .04 oz., then 6 oz. = _____ grams.

(15) $12 \times 23 =$ _____.

(16) The LCM of 10, 25 and 40 is _____.

(17) Find the smallest prime p, such that $3p + 5$ is an even number. _____.

(18) $15 \times 46 =$ _____.

(19) The median of 36, 34, 40 and 38 is _____.

*(20) $35997 \div 213 =$ _____ (Integer).

(21) $42 \times 45 =$ _____.

(22) If A = 14, B = 8 and C = 2B, then $AC \div B =$ _____.

(23) $.\overline{36} =$ _____ (fraction).

(24) $6\ 1/3 \times 9\ 1/3 =$ _____.

(25) If tickets cost $1.75, what will 13 cost? $ _____.

(26) $F(x) = 2 - (x + 1)^2$, evalnate F(1/2). _____.

(27) $213_7 =$ _____ 10.

(28) $(43 - 4 + 3 \times 6) \div 6$ has a remainder of _____.

(29) A car travels 210 miles in 3 1/3 hours. The average speed was _____ mph.

*(30) $219 \times 219 - 20 \times 221 =$ _____ (Integer).

(31) $.\overline{4} - .\overline{9} =$ _____ (fraction).

(32) $x/3 + y/4 = 1$ is a line. The slope is _____.

(33) $43_7 - 14_7 =$ _____ 7.

(34) If a = 4 and b = 3, then $(a + b)(a^2 - ab + b^2) =$ _____.

(35) How many integers greater than one and less than 18 are relatively prime to 18? _____.

(36) If $n(C \times D) = 24$ and $n(D) = 4$, then $n(C) =$ _____.

(37) Find k, $k > 0$, so that the roots of $x^2 + kx + 4 = 0$ are equal. _____.

(38) The next term in the sequence 2,6,8,12,14,... is _____.

(39) $3\ 3/4 \times 3\ 1/4 =$ _____.

*(40) $\sqrt{75625} - 5 =$ _____ (Integer).

(41) If $4^x = 8$, then $x =$ _____.

(42) The sum of the roots of $2x^2 - 6x + 9 = 0$ is _____.

(43) The area of an equilateral triangle is $\sqrt{3}$ sq. in. Each side has a length of _____ inches.

(44) The largest integer x, such that $x - 5 < 8$ is _____.

(45) The set 3,6,4,2,3,1,2 is bimodal and the sum of the modes is _____.

(46) Find b, if $4b_7 = 33$. _____.

(47) The diagonal of a square is 10 inches. Each side is _____ inches long.

(48) The distance between the lines $y = 4$ and $y = -3$ is _____.

(49) (x,y) is the midpoint of the segment from (2,4) to (7,11). $x =$ _____.

*(50) $28 \times 30 \times 32 =$ _____ (Integer).

(51) $(2 + 5i)^2 = a + bi$ and $b =$ _____.

(52) 1 radian = _____ degrees $\div \pi$.

(53) $\log_6 \sqrt{36} =$ _____.

(54) ${}_6C_4 =$ _____.

(55) Find x, if $\log_4 (5x - 1) = 3$. _____.

(56) The probability of drawing a face card or an ace from a standard deck of 52 cards is _____.

(57) $20 + 10 + 5 + \ldots =$ _____.

(58) The smallest value of x such that $|x - 3| \leq 9$ is _____.

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

*(60) $(41)^4 =$ _____ (Integer).

(61) Find Θ, if $\cos \Theta = \sin 150°$, $0° < \Theta < 90°$. _____°.

(62) The area of the ellipse $x^2/9 + y^2/16 = 1$ is $b\pi$ and $b =$ _____.

(63) How many 3-digit numbers end in a 5 or a 3? _____.

(64) $2 + 3 + 4 + 5 + \ldots + 49 =$ _____.

(65) A die is rolled. If it is an even number, find the probability that it is a two. _____.

(66) If $f(x) = \sqrt{x}$ and $g(x) = 2x + 1$, find $f[g(4)]$. _____.

(67) $\cos(\text{Arccos } 2/3) =$ _____.

(68) How many lines are determined by 4 points, no three of which are collinear? _____.

(69) 1 mile = _____ yards.

*(70) $142857 \times 33 =$ _____ (Integer).

(71) The vertical asymptote for $y = 1/x$ is $x =$ _____.

(72) A is 30% less than B and B is 10% less than C. A is what percent less than C? _____ %.

(73) Change .11, base 5, to a base ten decimal. _____.

(74) In a triangle with sides 4, 5 and 5, the area is _____.

(75) Two dice are thrown. What is the probability that their sum is divisible by 3? _____.

(76) $\lim_{x \to 4} \dfrac{x^2 - 16}{x - 4} =$ _____.

(77) $f(x) = 4x^2 - 2x + 1$, find $f'(1)$. _____.

(78) $f(x) = x + 1$, find $f^{-1}(x)$. _____.

(79) $\int_0^4 x^3 \, dx =$ _____.

*(80) $79 \times 1111 - 31 \times 1111 =$ _____ (Integer).