The University Interscholastic League

# Number Sense Test, Series TT-B

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) $7824 + 4175 =$ _____.

(2) $6(8) + 6(15) + 6(17) =$ _____.

(3) $(17 + 6)(7 + 4) =$ _____.

(4) $583 \div 11 =$ _____.

(5) $3/40 =$ _____ (decimal).

(6) Reduce to lowest terms: $105/129 =$ _____.

(7) $16 \times 11\ 3/8 =$ _____.

(8) 2 sq.ft. = _____ sq.in.

(9) $156 \div 12 =$ _____.

*(10) $398 \times 403 - 75 =$ _____.

(11) $12 \times 4 + 22 \div 2 - 1 =$ _____.

(12) $(.33)^2 =$ _____.

(13) The negative reciprocal of 2/5 is _____.

(14) 100 pints = _____ gallons.

(15) $216 \times 111 =$ _____.

(16) MCMX = _____ (Arabic Numeral).

(17) $(89 \times 87) \div 3$ has a remainder of _____.

(18) $(18 \times 15) + (14 \times 45) =$ _____.

(19) The LCM of 18, 27 and 36 is _____.

*(20) $39 \times 40 \times 41 - 50 =$ _____.

(21) Which is larger, 7/24 or 8/27? _____.

(22) 240 less 25% of 240 = _____.

(23) $\sqrt{(72)(18)} =$ _____.

(24) The perimeter of a square of area 6 1/4 sq.in. is _____ in.

(25) $213_7 =$ _____ $_{10}$

(26) $f(x) = 2x^3 - 4x$. Evaluate f(-3). _____.

(27) How many integers between 7 and 47 are divisible by 8? _____.

(28) $2^7 =$ _____.

(29) The greatest integer less than $4\sqrt{3}$ is _____.

*(30) $39312 \div 252 =$ _____ (integer).

(31) If $4/x = x/9$, $x < 0$, then $x =$ _____.

(32) The union of {1,2,3} and {3,4,5} is { _____ }.

(33) The area of a rhombus with diagonals 18" and 20" is _____ sq.in.

(34) $.2\overline{5} =$ _____ (fraction).

(35) $(32_4)(3_4) =$ _____ $_4$

(36) The next term in the sequence 2,0,3,1,4,2,5,... is _____.

(37) What is the largest root of $x^2 - x - 12 = 0$? _____.

(38) The area of an equilateral triangle with side 4 is _____.

(39) $7^3 + 12$ has a remainder of _____.

*(40) $202 \times 21 \times 203 =$ _____.

(41) In checking 250 houses with bugs, a company finds 175 with roaches and 125 with ants. How many have only ants? _____.

(42) Find x, if $4^{3x} = 64$. _____.

(43) The measure of the exterior angle of a regular decagon is _____°.

(44) The slope of a line perpendicular to $x + 2y = 6$ is _____.

(45) The x-intercept of the line $2x + y = 5$ is _____.

(46) What is the length of a tangent from a point 5" from the center of a circle with a diameter of 4"? _____".

(47) Find x, if $3^x = 1/81$. _____.

(48) The smallest integer x, such that $-3x + 1 < 7$, is _____.

(49) The area of a 30° – 60° right triangle with hypotenuse 2 is _____.

*(50) $262 \times 110 + 48 \times 108 =$ _____.

(51) The modulus of $3 + i$ is _____.

(52) $1 + 2 + 2^2 + 2^3 + 2^4 =$ _____.

(53) $i^{72} =$ _____.

(54) If $\log_6(x-1) = 3$, then $x =$ _____.

(55) If $x < 0$ and $|3x - 4| = 6$, then $x =$ _____.

(56) $(\log_5 125)^3 =$ _____.

(57) $3(3 - 2i) + i = a + bi$. $b =$ _____.

(58) The coefficient of $x^2y^2$ term in the expansion of $(x + y)^4$ is _____.

(59) If x and y vary directly and $x = 6$ when $y = 3$, find x when $y = 5$. _____.

*(60) $\sqrt{229441} =$ _____.

(61) $\sin 40° = \cos x$. $x =$ _____°.

(62) $9 + 3 + 1 + 1/3 + \ldots =$ _____.

(63) How many 4-digit odd numbers are there? _____.

(64) The odds of winning are 4 to 7. What is the probability of winning? _____.

(65) The volume of a pyramid is 36 and its height is 27. The area of the base is _____.

(66) $\text{Arccos}(\cos\pi) =$ _____.

(67) The area of a triangle with sides 7 and 8, and with an angle of 150° between them is _____.

(68) The maximum value of $y = 2\cos x$ is $y =$ _____.

(69) Two dice are tossed. What is the probability that the difference of the faces is 3? _____.

*(70) $142857 \times 29 =$ _____.

(71) $\cos 570° =$ _____.

(72) $\lim_{x \to 2} 3x^2 + 1/4 =$ _____.

(73) Change .41, base 6; to a base ten fraction. _____.

(74) In how many different ways can 5 people be seated at a round table? _____.

(75) Suppose $\sin .7 = .6$. What is $\csc .7$? _____.

(76) If $f(x) = \sqrt{2x}$, $f'(4) =$ _____.

(77) The remainder when $f(x) = 2x^3 + 3x^2 - 3$ is divided by $x - 1$ is _____.

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

(79) $(103_6) + (3_6) =$ _____ $_6$.

*(80) The perimeter of the ellipse $2x^2 + 4y^2 = 8$ is _____.