# The University of Texas Interscholastic League

## Number Sense Test, Series Z-8

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 the 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 star (*) 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.

Person conducting contest should explain these directions carefully to the contestants.

**Stop—Wait for Signal**

(1) $14 \times 15 =$ .....

(2) $32 \times 7/24 =$ .....

(3) $165 \div 15 =$ .....

(4) $63 + 75 =$ .....

(5) 28.5 is what percent of 1140? .....%.

(6) $2\frac{1}{8} \times 3\frac{1}{2} =$ .....

(7) $7/8 - 5/12 =$ .....

(8) $12.62 + 8.21 =$ .....

(9) $35 \times 11 =$ .....

*(10) $37 \times 526 =$ .....

(11) 62 doz. = .....eggs.

(12) 196 in. = .....yd.

(13) 5 mi. = .....rd.

(14) $22\frac{1}{2}\%$ = .....(fraction).

(15) 714 = $87\frac{1}{2}\%$ of .....

(16) 7/12 = .....%.

(17) 70% of 623 = .....

(18) $16 + 18 - 12 =$ .....

(19) $75 \times 75 =$ .....

*(20) $5 \times 7 \times 11 \times 13 =$ .....

(21) Find the interest on $526 for 2 yr. at 6%. $.....

(22) How much should be invested for $1\frac{1}{2}$ yr. at 8% in order to yield $2400? $.....

(23) Find the tax on 7,327,622 gal. gas at 8¢ per gal. $.....

(24) At 25¢ on the $100 what is the tax on a farm valued at $12000? $.....

(25) If the government pays $8 per acre to Mr. Jones for allowing 120 acres to lie fallow, how much did it pay him? $.....

(26) $133\frac{1}{3} \times 1515 =$ .....

(27) $28 \times 32 =$ .....

(28) $27\ 3/7 \div 3 =$ .....

(29) If the sides of a triangle are 5", 12", and 13", what is the length of the projection of the short leg on the hypotenuse? ..... in.

*(30) What percent larger is 622 than 500? .....%.

(31) If a rectangular trough has its length and width doubled with the depth remaining the same, its volume is multiplied by .....

(32) A trapezoid has x as one base and 2x as its altitude. If both bases are doubled while the altitude remains fixed, the area is multiplied by .....

(33) How many degrees are in each exterior angle of a regular pentagon? .....°.

(34) Find the next term of 1, 2, 4, 6, 10, 12, 16, . . . .....

(35) What is the sum of two numbers which satisfy $2x^2 - 3x + 7 = 0$? .....

(36) What is the largest prime less than 100? .....

(37) Which is the larger, 19/17 or 21/19? .....

(38) What is the least common denominator: 1/33, 1/35, 1/6? .....

(39) Find the number of divisors of $2^2 \times 4 \times 5$. .....

*(40) $7 \times 11 \times 13 \times 17 =$ .....

(41) Find the sum of the divisors of $2^2 \times 3 \times 5$. .....

(42) How many positive integers less than or equal $2^2 \times 3 \times 5$ are relatively prime to it? .....

(43) How many elements are in the power set for the set of primes between 10 and 20? .....

(44) If $A \times B$ is the Cartesian product of A and B, then $A \cap (A \times B)$ has how many elements in it? .....

(45) The altitude of a triangle of area 721 sq. in. is 30 in. Find the base. .....

(46) $\{0, 1, 2\} \cup (\{1, 2, 3\} \cap \{1, 2, 3, 4\}) = \{$.....$\}$.

(47) $(\{0, 1, 2\} \cup \{1, 2, 3\}) \cap (\{0, 1, 2\} \cup \{1, 2, 3, 4\}) = \{$.....$\}$.

(48) A rectangular parallelepiped has two edges multiplied by 3/2. The

other remains fixed, and the figure is still a parallelepiped. What is the volume multiplied by? .....

(49) $33\frac{1}{3}\%$ of $37\frac{1}{2}\%$ of 896 = .....

*(50) The largest possible right circular cylinder is cut from a cube of volume 1000 cu. in. The volume of the cylinder is ..... cu. in.

(51) A circular floor is divided into three sectors by radii. How many ways can it be painted so as to use all three of three colors of paint? .....

(52) If $6 + 2x = x + 10$, then x = .....

(53) What is the exact number of days from January 1, 1964 to June 1, 1964? ..... days.

(54) At $12\frac{1}{2}$ pesos to the dollar, how many pesos are in \$188? ..... pesos.

(55) What is the difference of the areas of two circles of radii 5" and 2". ..... pi sq. in.

(56) $12\frac{1}{2}\% \times 37\frac{1}{2}\% \times 192$ = .....

(57) The short side of a 30° right triangle is $5\frac{1}{2}$". The hypotenuse is ..... ".

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

(59) John is twice as old as Tom. Five years ago he was three times as old as Tom. How old is Tom? ..... yr.

*(60) The largest possible sphere is cut from a cube. what is the percent cut away? ..... %.

(61) $2\frac{2}{3} - 1\frac{5}{6}$ = .....

(62) \$175 × 21 = \$.....

(63) If the edge of a regular tetrahedron is $\sqrt{6}$", the altitude is ..... in.

(64) $2\frac{1}{2} \times 3\frac{3}{5}$ = .....

(65) If 120 acres are enough to graze 75 cows, at the same rate how many acres will it take to graze 125 cows? ..... A.

(66) $175 \times 27$ = .....

(67) A recipe calls for $3\frac{1}{2}$ cups of flour. If the recipe is tripled, how many cups of flour will it take? ..... cups.

(68) What is the total surface area of a cylindrical can 8" high and 5" in diameter? ..... pi sq. in

(69) At \$2.50 an oz., how much will 1 lb. blue bonnet seeds cost? \$.....

*(70) At 8 lb. per gal. and $7\frac{1}{2}$ gal. per cu. ft., what is the weight of water in a full cylindrical tank 5 ft. high and 6 ft. in diameter, ..... lb.

(71) A sail boat traveling at the rate of $6\frac{1}{2}$ miles per hour went 132 miles. How long did it take? ..... hr.

(72) $1.9 \times 1.9$ = .....

(73) $28 \times 28$ = .....

(74) $32^2 - 28^2$ = .....

(75) $9^3 - 7^3$ = .....

(76) $28^2 - (5 \times 28) + 6$ = .....

(77) If $28^x = 1$, then x = .....

(78) How many solutions does $\sqrt{5 - x^2} = -3$ have? .....

(79) A line from P intersects a circle in A and B so that PB = 8'. A tangent from P is 4' long. The length of PA = ..... ft.

*(80) $59^3$ = .....