

The University Interscholastic League  
Number Sense Test, Series 9783

Final \_\_\_\_\_  
2nd \_\_\_\_\_  
1st \_\_\_\_\_  
Score \_\_\_\_\_ Initials \_\_\_\_\_

Contestant's Number \_\_\_\_\_

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)  $3789 + 9783 =$  \_\_\_\_\_
- (2)  $25 \times 237 =$  \_\_\_\_\_
- (3)  $13 \times 37 + 37 \times 30 =$  \_\_\_\_\_
- (4)  $389 \div 9 =$  \_\_\_\_\_ (mixed number).
- (5)  $32 - 8 \times 5 \div 4 =$  \_\_\_\_\_
- (6)  $11 \times 137 =$  \_\_\_\_\_
- (7)  $1.3 \div 2 \frac{1}{2} =$  \_\_\_\_\_
- (8)  $15 \times 6.2 =$  \_\_\_\_\_
- (9)  $1234 \times 9 + 5 =$  \_\_\_\_\_
- \*(10)  $33 + 333 + 3333 + 33333 =$  \_\_\_\_\_
- (11) If 7 pens cost \$4.83 then 4 pens cost \$ \_\_\_\_\_
- (12)  $3 \frac{1}{5}\% =$  \_\_\_\_\_ (fraction).
- (13) If the average of  $x$ , 28, 35 and 41 is 31 then  $x =$  \_\_\_\_\_
- (14)  $.76\% =$  \_\_\_\_\_ (fraction).
- (15)  $3.92 - 4.17 =$  \_\_\_\_\_
- (16)  $\frac{5}{3} - \frac{5}{6} - \frac{5}{9} =$  \_\_\_\_\_
- (17)  $5 \frac{1}{3} \times 7 \frac{1}{3} =$  \_\_\_\_\_ (mixed number).
- (18)  $12 \times 47 =$  \_\_\_\_\_
- (19)  $\frac{13}{17} \times 13 =$  \_\_\_\_\_ (mixed number).
- \*(20)  $398 \times 219 =$  \_\_\_\_\_
- (21) How many minutes are there from 9:22 pm to 6:48 am the next morning? \_\_\_\_\_
- (22)  $13.3 \times 10^2 - 47 =$  \_\_\_\_\_
- (23) How many positive prime integers divide 42? \_\_\_\_\_
- (24)  $\frac{9}{40} =$  \_\_\_\_\_ % (mixed number).
- (25)  $(64 - 3 \times 9) \div 4$  has a remainder of \_\_\_\_\_
- (26) Find the value of  $k$  so that the slope of the line  $2x + ky = 5$  is 4.  $k =$  \_\_\_\_\_
- (27)  $4 \frac{1}{5} \times 4 \frac{4}{5} =$  \_\_\_\_\_ (mixed number).
- (28) How many days are there from March 14, 1997 to July 4, 1997? \_\_\_\_\_
- (29) The GCD of 52 and 65 is \_\_\_\_\_
- \*(30)  $72250 \div 125 =$  \_\_\_\_\_
- (31) How many subsets does the  $\{a, b, c, d\}$  have? \_\_\_\_\_
- (32)  $\frac{8}{15} - \frac{15}{31} =$  \_\_\_\_\_

- (33) A square has a diagonal of 8. Its area is \_\_\_\_\_ sq. units.
- (34) If  $ax^2 + bx + c = (3x - 2)^2$  then  $b =$  \_\_\_\_\_.
- (35)  $(23_6)(5_6) =$  \_\_\_\_\_.
- (36) The smaller root of  $x^2 + 4x - 21 = 0$  is \_\_\_\_\_.
- (37)  $.3777\dots =$  \_\_\_\_\_ (fraction).
- (38)  $223 \times 227 =$  \_\_\_\_\_.
- (39) The sides of a square decrease from 36 to 32. The area decreases by \_\_\_\_\_ sq. units.
- \*(40)  $98 \times \frac{1}{7} \times \frac{1}{4} \times 728 =$  \_\_\_\_\_.
- (41) If  $2x - y = 8$  and  $x - 2y = 7$  then  $x =$  \_\_\_\_\_.
- (42) If  $(32)^{3/2} = xy^{1/2}$ ,  $y < 8$  then  $x =$  \_\_\_\_\_.
- (43) If  $3 - 5x < 9$  then  $x >$  \_\_\_\_\_.
- (44)  $993 \times 998 =$  \_\_\_\_\_.
- (45) 97.6 is what percent more than 80? \_\_\_\_\_ %.
- (46) If  $3x - 4 = 23$  then  $3x + 2 =$  \_\_\_\_\_.
- (47) The next term of 3, 7, 13, 21, 31, ... is \_\_\_\_\_.
- (48) If  $12^{-1} + x^{-1} = 3^{-1}$  then  $x =$  \_\_\_\_\_.
- (49)  $33^2 + 99^2 =$  \_\_\_\_\_.
- \*(50)  $\sqrt{520} + \sqrt{1150} =$  \_\_\_\_\_.
- (51) The smallest value of  $x$  such that  $|2x - 3| \leq 5$  is \_\_\_\_\_.
- (52)  $(3 + 4i)(3 - 4i) =$  \_\_\_\_\_.
- (53) A regular polygon of 15 sides has an interior angle of \_\_\_\_\_ degrees.
- (54) If  $\log_x 4 = 2$  then  $x =$  \_\_\_\_\_.
- (55) If 34 is in base 7, then its positive square root in base 10 is \_\_\_\_\_.
- (56) 104 deg. Fahrenheit = \_\_\_\_\_ deg. Celsius.
- (57) 15% of 45 is 25% of \_\_\_\_\_.
- (58) The total surface area of a 4" x 3" x 4" rectangular box is \_\_\_\_\_ sq. inches.
- (59) The simplified coefficient of the 4th term in the expansion of  $(x + y)^7$  is \_\_\_\_\_.
- \*(60)  $142857 \times 14 =$  \_\_\_\_\_.
- (61)  $\sin 210^\circ =$  \_\_\_\_\_.
- (62)  $(2 + 3i)^2 = a + bi$  and  $b =$  \_\_\_\_\_.
- (63) A rhombus has an area of 12 sq. units. The product of its diagonals is \_\_\_\_\_.
- (64) .5 mile is \_\_\_\_\_ feet.
- (65) How many positive integers less than or equal to 31 are relatively prime to 31? \_\_\_\_\_.
- (66) 20 degrees = \_\_\_\_\_ radians.
- (67) How many positive four digit numbers end in a 1 or 3? \_\_\_\_\_.
- (68)  $\tan(\arcsin \frac{3}{5}) =$  \_\_\_\_\_.
- (69) Four coins are tossed. Find the probability of getting 2 heads and 2 tails. \_\_\_\_\_.
- \*(70)  $(24)^4 =$  \_\_\_\_\_.
- (71) Change .32, base 4, to a base 8 decimal. \_\_\_\_\_.
- (72) Find  $x$ ,  $0 \leq x \leq 6$ , if  $3x - 5 \equiv 17 \pmod{7}$ . \_\_\_\_\_.
- (73) Let  $t_n$  denote the  $n$ th triangular number. Find the value of  $t_8 + t_7$ ? \_\_\_\_\_.
- (74)  $(2x^3 - x^2 + 2x + 1) \div (x - 2)$  has a remainder of \_\_\_\_\_.
- (75) Write the first four nonzero digits of the decimal for  $\frac{41}{90}$ ; 0. \_\_\_\_\_.
- (76)  $\lim_{x \rightarrow 2} \frac{x^3 - 8}{x - 2} =$  \_\_\_\_\_.
- (77) If  $\cos A = \frac{1}{5}$  then  $\cos 2A =$  \_\_\_\_\_.
- (78) The  $n$ th term of 3, 6, 11, 18, 27, ... is \_\_\_\_\_.
- (79)  $\int_1^{1.25} x^{-2} dx =$  \_\_\_\_\_.
- \*(80)  $(1 + 2 + 3 + \dots + 20)^2 =$  \_\_\_\_\_.