

The University Interscholastic League
Number Sense Test, Series VV-4

Contestant's Number _____

Contestant's Score _____

**Read Directions Carefully
 Before Beginning Test**

**Do Not Unfold This Sheet
 Until Told To Begin**

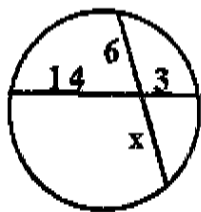
DIRECTIONS: Do not turn this page until the person conducting this test gives the signal to begin. This is a ten-minute test. There are 80 problems. Solve accurately and quickly as many as you can in the order in which they appear. **ALL PROBLEMS ARE TO BE SOLVED MENTALLY.** Make no calculations with 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!

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| <p>(1) $1989 + 9891 - 2001 =$ _____</p> <p>(2) $25 \times 54 =$ _____</p> <p>(3) $8\frac{3}{4}\%$ = _____ (fraction).</p> <p>(4) $348 - 843 =$ _____</p> <p>(5) $7 \times 14 + 43 \times 14 =$ _____</p> <p>(6) $327 \div 9 =$ _____ (mixed number).</p> <p>(7) $4 \times 23\frac{1}{2} =$ _____</p> <p>(8) $53^2 =$ _____</p> <p>(9) $13 \div 1\frac{1}{2} =$ _____ (improper fraction).</p> <p>*(10) $32 + 369 \times 372 =$ _____</p> <p>(11) $2 + 10^2 \times 243 =$ _____</p> <p>(12) $649 \div 11 =$ _____</p> <p>(13) $12 \times 37 =$ _____</p> <p>(14) Which is smaller $\frac{5}{23}$ or $\frac{7}{25}$? _____</p> <p>(15) 1 cubic foot = _____ cubic inches.</p> <p>(16) $1 + 2 + 3 + \dots + 39 =$ _____</p> <p>(17) The LCM of 12, 14 and 28 is _____</p> <p>(18) $\frac{1}{2}$ of 4 feet 2 inches = _____ inches.</p> <p>(19) $56 \times 64 =$ _____</p> | <p>*(20) $119448 \div 189 =$ _____</p> <p>(21) $(9^2 \times 5^2 \times 3) \div (9 \times 3) =$ _____ (numeral).</p> <p>(22) 44 less $37\frac{1}{2}\%$ of 32 is _____</p> <p>(23) $(15^2 + 15 + 1) \div 7$ has a remainder of _____</p> <p>(24) If $x = 4$, then $x^4 - 4x^2 + 4 =$ _____</p> <p>(25) $\sqrt{(1500)(60)} =$ _____</p> <p>(26) How many positive prime integers divide 43?
 _____</p> <p>(27) The product of the LCM and GCD of 33 and 14 is _____</p> <p>(28) $42_7 - 14_7 =$ _____ $_7$</p> <p>(29) $32 \times 111 =$ _____</p> <p>*(30) $(198 \times 98)^2 \div (98 \times 100) =$ _____</p> <p>(31) The sum of three consecutive integers is 207. The smallest number is _____</p> <p>(32) $41 \times 49 =$ _____</p> <p>(33) $(32_6)(4_6) =$ _____ $_6$</p> <p>(34) $.27 =$ _____ (fraction).</p> <p>(35) The number of positive integral divisors of 24 is _____</p> <p>(36) Find x, if $x + y = 4$ and $y = 4x$. $x =$ _____</p> <p>(37) $6\frac{1}{3} \times 6\frac{2}{3} =$ _____ (mixed number).</p> |
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- (38) $\frac{x}{4} + \frac{y}{2} = 1$ is a line. The slope is _____.
- (39) $.3 \div .6 =$ _____ (decimal).
- *(40) $141 \times 39 \times 139 =$ _____.
- (41) $96 \times 97 =$ _____.
- (42) If $n(B) = 7$ and $n(B \times D) = 35$, then $n(D) =$ _____.
- (43) $76 \times 36 =$ _____.
- (44) The distance from (2,1) to (5,5) is _____.
- (45) If $x > 0$ and $|4x + 3| = 31$, then $x =$ _____.
- (46) The set {8,5,4,7,2,4,2} is bimodal and the larger mode is _____.
- (47) $4^{-1} + 4^{-2} =$ _____.
- (48) The remainder in base 6, when 124, base 6, is divided by 5 is _____.
- (49) How many distinct diagonals does a polygon of 10 sides have? _____.
- *(50) $\sqrt{14641} =$ _____.
- (51) $96 \times 105 =$ _____.
- (52) $\frac{1}{5} + \frac{1}{25} + \frac{1}{125} + \dots =$ _____.
- (53) How many positive integers less than 16 are relatively prime to 16? _____.
- (54) Find the modulus of $1 + 2i$. _____.
- (55) Find x .



$x =$ _____.

- (56) $(3 + 2i)(3 - 2i) =$ _____.
- (57) $\log_5 125 =$ _____.
- (58) $1 + 2 \sin 90^\circ =$ _____.

- (59) $(\log_4 7)(\log_7 4) =$ _____.
- *(60) $.3 \times 996543 =$ _____.
- (61) $\sin^2 3x + \cos^2 3x =$ _____.
- (62) How many 3-digit numbers are odd? _____.
- (63) Find B, if $\sin B = \sin 125^\circ$, $0^\circ < B < 90^\circ$. $B =$ _____.
- (64) The sum of the coefficients in the expansion of $(2x + y)^4$ is _____.
- (65) ${}_6P_3 =$ _____.
- (66) $\sin(\text{Arccos } \frac{1}{2}) =$ _____.
- (67) The tenth term in the sequence 2, 6, 10, 14, ... is _____.
- (68) Find b, if $62_b = 44$. $b =$ _____.
- (69) Two dice are tossed. What is the probability that the sum of the faces is 10? _____.
- *(70) $1111 \times 135 =$ _____.
- (71) $\det \begin{vmatrix} 4 & 5 \\ 7 & 6 \end{vmatrix} =$ _____.
- (72) Change .33, base 6, to a base 10 fraction. _____.
- (73) Find x , $0 \leq x < 8$, if $2x + 1 \equiv 25 \pmod{9}$.
_____.
- (74) $\lim_{x \rightarrow 4} \frac{x^3 - 64}{x - 4} =$ _____.
- (75) If $f(x) = 2x$, then $f^{-1}(x) =$ _____.
- (76) The maximum value of $y = -2x^2 + 8$ is _____.
- (77) $f(x) = x^3$, find $f[f(2)]$. _____.
- (78) $\int_1^3 x \, dx =$ _____.
- (79) $f'(x) = 3x$, $f(x) = ax^2 + b$, find a. _____.
- *(80) $(19)^4 =$ _____.