The University Interscholastic League
Number Sense Test • HS A • 2026

Final _____ _____

Contestant's Number _____ 2nd _____ _____

1st _____ _____

Score **Initials**

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 percent 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) $20726 - 10926 =$ _____

(2) $192.6 + 27.26 =$ _____ **(decimal)**

(3) $9 \times 321 - 1 =$ _____

(4) $1\frac{2}{7} \times \frac{14}{27} =$ _____

(5) $26 \times 27 - 19 \times 26 =$ _____

(6) $\frac{3}{5}\% =$ _____ **(decimal)**

(7) Which is larger $\frac{7}{9}$ **or 0.7** _____

(8) The arithmetic mean of 1, 9, 2, 6, 2, 7, 2, and 6 is __

(9) $11 \times \frac{11}{14} =$ _____ **(mixed number)**

***(10)** $192 + 6272 + 6272 + 629 =$ _____

(11) $111 \times \frac{11}{37} =$ _____

(12) $2 + 7 + 12 + 17 + 22 + \ldots + 47 + 52 =$ _____

(13) The GCD of 20 and 26 is _____

(14) 223×13 **is** _____

(15) $1791 \times 9 + 82 =$ _____

(16) $(9 + 7)^2 =$ _____

(17) 1 dekagram = .4 oz. and 2.6 oz. = _____ **grams**

(18) The sum of the positive divisors of 16 is _____

(19) $15^2 - 12^2 = 9 \times$ _____

***(20)** $109 \times 207 - 2626 =$ _____

(21) 18% of 600 is _____**% of 300**

(22) If $2x + 7 = -19$**, then x =** _____

(23) $4\frac{1}{8} \times 16\frac{1}{2} =$ _____ **(mixed number)**

(24) The multiplicative inverse of 0.08333... is _____

(25) 40 is _____ **% of 44.444...**

(26) 0.9777... = _____ **(proper fraction)**

(27) $0.25 - 0.125 - .0625 =$ _____ **(fraction)**

(28) $48 \times 48 =$ _____

(29) $\frac{5}{8} - \frac{24}{41} =$ _____

***(30)** $\sqrt{109207} =$ _____

(31) 0.008 = _____**% (fraction)**

(32) $\sqrt{529} =$ _____

(33) The area of a square is 256 sq. cm. The perimeter of the square is _____ **cm**

(34) If $\frac{3x-1}{3x+1} + \frac{3x+1}{3x-1} = 2 + \frac{B}{9x^2-1}$**, then B =** _____

(35) $3^2 \div 1.5^2 \times 0.75^2 =$ _____

(36) $(5^7 + 4^7 + 14) \div 9$ has a remainder of _____

(37) How many 3-digit numbers can be made using these four the digits 1, 9, 2, and 7? _____

(38) The 10^{th} term of the sequence 2, 3, 5, 7, ... is 29. The 8^{th} term is _____

(39) $207_9 =$ _____ 10

*(40) 3 yards + 2 feet + 1 inch = _____ centimeters

(41) 0.58333... = _____ (fraction)

(42) Let $(x + 9)(2x - 9) = ax^2 + bx + c$. Find $a + b + c =$ _____

(43) $33 \times 73 =$ _____

(44) $\frac{1}{3} + \frac{1}{6} + \frac{1}{10} + ... + \frac{1}{78} =$ _____

(45) $4^3 - 1 =$ _____ 4

(46) A 30°-60°-90° triangle has a base length of $3\sqrt{3}$ ". The sum of the lengths of the other sides is _____ "

(47) How many 3-digit numbers greater than 200 can be made using these four digits 1, 9, 2, and 7? ____

(48) The sum of the roots plus the sum of the product of the roots taken two at a time of $x^3 + 4x^2 - 12x - 8 = 0$ is _____

(49) $2026_9 \times 7_9 =$ _____ 9

*(50) $(3208 \times 0.875)^2 =$ _____

(51) $\overline{\text{XCMXXVI}} =$ _____ (Arabic Numeral)

(52) The point (9, 7) is reflected across the line $y = x + 1$ to the point (h, k). Find $h + k$. _____

(53) The sum of the digits of a 3-digit number is 9. How many such numbers exist? _____

(54) Let (p, q) be the midpoint of the segment with endpoints (— 1, 9) and (2, — 7). Find $p + q$. _____

(55) $\prod_{k=1}^{k=5} k =$ _____

(56) The point (— 2, 2) lies on a circle with center at (1, — 1). The area of the circle is $k\pi$. Find k. _____

(57) A carton contains 9 white and 7 brown eggs. If 2 eggs are randomly selected for breakfast, what are the odds that both are brown? _____

(58) If ${}_5P_3 = k \times ({}_5C_3)$, then k = _____

(59) $1234_5 \div 11_5$ has a remainder of _____ 5

*(60) $\sqrt[3]{10920726} =$ _____

(61) The sum of the median, the mode, and the range of 6, 2, 7, 2, 6, 2, 9, and 1 is _____

(62) $987 \times 9 + 5 =$ _____

(63) If $\frac{12}{40}$ base 5 = 0.abbb... base 5, then $a + b =$ _____

(64) If $\cos\theta = -0.5$, $\theta \in$ QIII, then $\theta =$ _____°

(65) $\begin{vmatrix} 1 & 9 \\ -2 & 7 \end{vmatrix} =$ _____

(66) $\lfloor \sqrt{2} + \sqrt{7} \rfloor =$ _____

(67) If $xy = 3$ and $x - y = 7$ then $x^3 - y^3 =$ _____

(68) $13^{31} \div 14$ has a remainder of _____

(69) The roots of $x^3 + 4x^2 - 12x - 8 = 0$ are d, e, and f. Find $(d + e)(e + f)(f + d)$. _____

*(70) The volume of a right rectangular pyramid with base length 19 dm, base width 27 dm, and height 26 dm is _____ cu. dm

(71) $109 \times 207 =$ _____

(72) If ${}_5C_2 = k \times ({}_5P_2)$, then k = _____

(73) Change 0.31_4 to a base 4 fraction. _____ 4

(74) $h(x) = x^3 + 9x^2 + 2x + 7$ and $h''(-2) =$ _____

(75) The slope of the line through points (7, 1) and (2, 9) is _____

(76) $\int_0^1 \int_0^9 (x + y)\, dxdy =$ _____

(77) Let $f(x) = 2 - \frac{x-9}{7}$. Find $f^{-1}(6)$. _____

(78) $f(x) = \frac{x+3}{x^2-9}$. The vertical asymptote is at x = _____

(79) $2899 \div 13 =$ _____

*(80) $(1092620726)^{\frac{1}{4}} =$ _____

University Interscholastic League - Number Sense Answer Key HS ● Invitation A ● 2026

***number) x — y means an integer between x and y inclusive**

NOTE: If an answer is of the type like $\frac{2}{3}$ it cannot be written as a repeating decimal

(1) 9,800

(2) 219.86

(3) 2,888

(4) $\frac{2}{3}$

(5) 208

(6) .006

(7) $\frac{7}{9}$

(8) 4.375, $\frac{35}{8}$, $4\frac{3}{8}$

(9) $8\frac{9}{14}$

***(10) 12,697 — 14,033**

(11) 33

(12) 297

(13) 2

(14) 2,899

(15) 16,201

(16) 256

(17) 65

(18) 31

(19) 9

***(20) 18,941 — 20,933**

(21) 36

(22) — 13

(23) $68\frac{1}{16}$

(24) 12

(25) 90

(26) $\frac{44}{45}$

(27) $\frac{1}{16}$

(28) 2,304

(29) $\frac{13}{328}$

***(30) 314 — 346**

(31) $\frac{4}{5}$

(32) 23

(33) 64

(34) 4

(35) 2.25, $\frac{9}{4}$, $2\frac{1}{4}$

(36) 5

(37) 24

(38) 19

(39) 169

***(40) 321 — 354**

(41) $\frac{7}{12}$

(42) — 70

(43) 2,409

(44) $\frac{11}{13}$

(45) 333

(46) 9

(47) 18

(48) — 16

(49) 15206

***(50) 7,485,287 — 8,273,211**

(51) 10,926

(52) 16

(53) 45

(54) 1.5, $\frac{3}{2}$, $1\frac{1}{2}$

(55) 120

(56) 18

(57) $\frac{7}{33}$

(58) 6

(59) 2

***(60) 211 — 232**

(61) 14

(62) 8,888

(63) 4

(64) 240

(65) 25

(66) 4

(67) 406

(68) 13

(69) 40

***(70) 4,224 — 4,668**

(71) 22,563

(72) .5, $\frac{1}{2}$

(73) $\frac{31}{100}$

(74) 6

(75) $-1.6, -\frac{8}{5}, -1\frac{3}{5}$

(76) 45

(77) — 19

(78) 3

(79) 223

***(80) 173 — 190**