The University Interscholastic League
Number Sense Test • HS Regional • 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) $4242 - 526 =$ _____

(2) $42.4 + 25.26 =$ _____ **(decimal)**

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

(4) The arithmetic mean of 4, 2, 4, 2, 5, 2, and 6 is ____

(5) $26 \times 24 + 25 \times 26 =$ _____

(6) $9 \times 4321 - 1 =$ _____

(7) Which is larger $\frac{2}{5}$ or 0.24 _____

(8) $4\frac{2}{5} \div \frac{6}{25} =$ _____

(9) $25^2 =$ _____

***(10)** $42426 + 62524 + 2026 + 6202 =$ _____

(11) The GCD(24, 42) minus the LCM(24, 42) is _____

(12) $3 + 8 + 13 + 18 + ... + 43 + 48 =$ _____

(13) $15 \times \frac{17}{19} =$ _____ **(mixed number)**

(14) $425 \times 17 =$ _____

(15) $2494 \times 6 + 72 =$ _____

(16) $\frac{25}{37} \times$ _____ $= 300$

(17) 1 gram = .4 oz. and 4.25 oz. = _____ grams

(18) The sum of the proper divisors of 25 is _____

(19) $24^2 - 26^2 = 4 \times$ _____

***(20)** $424 \times 425 - 2026 =$ _____

(21) The additive inverse of 0.4375 is _____ **(fraction)**

(22) $(\{r, e, g, i, o, n\} \cap \{n, u, m, b, e, r\}) \cup \{c, e, n, t, s\}$ contains how many distinct elements? _____

(23) $\left(\sqrt[3]{2197}\right)^2 =$ _____

(24) 24% of 200 is 25% of _____

(25) How many 4-digit numbers can be made using the digits 4, 2, 5, 0, and 6 without repetition? _____

(26) If $4x - 24 = -25$, then $20x - 26 =$ _____

(27) A regular hexagon has _____ distinct diagonals

(28) $0.58333... \div 0.4375 =$ _____

(29) Find the sum of the prime numbers p, where $14 \leq p \leq 25$. _____

***(30)** $\sqrt{52424} =$ _____

(31) $44 \times 45 =$ _____

(32) If $25^2 \div 12.5^2 \times n^2 = 156\frac{1}{4}$, then $|n| =$ _____

(33) $(24^3 + 25^3 - 26) \div 7^2$ has a remainder of _____

(34) $\frac{25}{26} + \frac{26}{25} =$ _____

(35) $4\frac{2}{5} \times 5\frac{3}{4} =$ _____ **(mixed number)**

(36) $\frac{5}{6} - \frac{19}{25} =$ _____

(37) The perimeter of a rectangle with a 4" width is 24". The area of the rectangle is _____ sq. inches

(38) $425 =$ _____ $_4$

(39) The 12^{th} term of the sequence 25, 29, 33, 37, ... is 69. The 17^{th} term is _____

***(40)** 4 yards + 2 feet + 5 inch = _____ centimeters

(41) Two numbers have a difference of 15, a product of 100, and a sum of _____

(42) If P is $\frac{4}{5}$ of Q and Q is $\frac{1}{2}$ of R, then R is what percent of P? _____

(43) The product of the coefficients of the terms in the expansion of $(2x + y)^3$ is _____

(44) $_6C_2 - {}_5P_2 =$ _____

(45) $42_6 \times 5_6 + 425_6 =$ _____ $_6$

(46) If $\frac{25}{330} = 0.abcbcbc...$, then $a + b + c =$ _____

(47) A line with a slope of $\frac{4}{5}$ passes through (0, 0) and (x, — 6). The value of x is _____

(48) $\sum_{x=0}^{x=4} (2^x + 5) =$ _____

(49) If $A > 1$ and $A^4 \div A^{-2} \times A^k = A^5$, then k = _____

***(50)** $\sqrt[3]{2025524424} =$ _____

(51) $5^3 - 1 =$ _____ $_5$

(52) $424_5 \div 10_5$ has a remainder of _____

(53) $\log_9(729) = 3\log_3($ _____ $)$

(54) The point (4, 24) is reflected across the line $y = x + 25$ to the point (h, k). Find h — k. _____

(55) The odds of randomly selecting a triangular numbered day in the month of April is _____

(56) $(ax + k)^2 = nx^2 - 40x + 16$ and $|a| =$ _____

(57) Find the sum of the reciprocals of the first twenty-five triangular numbers. _____

(58) $83 \times 23 =$ _____

(59) The roots of the cubic $x^3 + px^2 + qx + r = 0$ are — 4, — 2, and 5. Find q. _____

***(60)** $\sqrt[4]{424252026} =$ _____

(61) $9876 \times 9 + 4 =$ _____

(62) $\sqrt[3]{140608} =$ _____

(63) $\lfloor 2e \rfloor - \lceil 5\pi \rceil =$ _____

(64) $\sin(-240°) \div \cos(-210°) =$ _____

(65) $4 \times \begin{vmatrix} 2 & 4 \\ 2 & 0 \end{vmatrix} + \begin{vmatrix} 2 & 5 \\ 2 & 6 \end{vmatrix} =$ _____

(66) $202^3 =$ _____

(67) If $xy = -2$ and $x - y = 5$ then $x^3 - y^3 =$ _____

(68) If $\frac{5}{15}$ base 7 = 0.ababab... base 7, then $a + b =$ ____

(69) $25^{23} \div 33$ has a remainder of _____

***(70)** $100\left(\frac{\sqrt{5}+1}{2}\right)$ Egyptian cubits = _____ inches

(71) $\frac{2}{5}$ of 25% of 25 is _____

(72) Let $f(x) = 2x - 5$. Find $f^{-1}(f(2) - 5)$. _____

(73) Change $\frac{4}{25}$ to a base 5 decimal. _____ $_5$

(74) $\prod_{k=2}^{k=5} [(k)^{-1}(k - 4)] =$ _____

(75) $253 \times 257 =$ _____

(76) $\int_2^5 (4x)\,dx - \int_2^6 (4x)\,dx =$ _____

(77) $h(x) = 2x^3 + 5x^2 + 2x + 6$ and $h''(4) =$ _____

(78) $0.2 - 0.1 + 0.05 - 0.025 + ...$ _____

(79) The product of the roots of $(2x + k)^2 = 0$ is 0.25. Find k, if $k > 0$. _____

***(80)** A right cylinder is 25" high with a 4" diameter. Its total surface area is _____ in^2

DO NOT DISTRIBUTE TO STUDENTS BEFORE OR DURING THE CONTEST

University Interscholastic League - Number Sense Answer Key HS ● Regional ● 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) 3,716

(2) 67.66

(3) $\frac{1}{120}$

(4) $\frac{25}{7}$, $3\frac{4}{7}$

(5) 1,274

(6) 38,888

(7) .4, $\frac{2}{5}$

(8) $\frac{55}{3}$, $18\frac{1}{3}$

(9) 625

***(10) 107,520 — 118,836**

(11) — 162

(12) 255

(13) $13\frac{8}{19}$

(14) 7,225

(15) 15,036

(16) 444

(17) 10.625, $\frac{85}{8}$, $10\frac{5}{8}$

(18) 6

(19) — 25

***(20) 169,266 — 187,082**

(21) — $\frac{7}{16}$

(22) 6

(23) 169

(24) 192

(25) 96

(26) — 31

(27) 9

(28) $\frac{4}{3}$, $1\frac{1}{3}$

(29) 59

***(30) 218 — 240**

(31) 1,980

(32) 6.25, $\frac{25}{4}$, $6\frac{1}{4}$

(33) 23

(34) $\frac{1301}{650}$, $2\frac{1}{650}$

(35) $25\frac{3}{10}$

(36) $\frac{11}{150}$

(37) 32

(38) 12221

(39) 89

***(40) 418 — 461**

(41) 25

(42) 250

(43) 576

(44) — 5

(45) 1203

(46) 12

(47) — 7.5, $-\frac{15}{2}$, $-7\frac{1}{2}$

(48) 56

(49) — 1

***(50) 1,202 — 1,328**

(51) 444

(52) 4

(53) 3

(54) — 30

(55) $\frac{7}{23}$

(56) 5

(57) $\frac{25}{13}$, $1\frac{12}{13}$

(58) 1,909

(59) — 22

***(60) 137 — 150**

(61) 88,888

(62) 52

(63) — 11

(64) — 1

(65) — 30

(66) 8,242,408

(67) 95

(68) 8

(69) 16

***(70) 2,724 — 3,010**

(71) 2.5, $\frac{5}{2}$, $2\frac{1}{2}$

(72) — .5, $-\frac{1}{2}$

(73) .04

(74) 0

(75) 65,021

(76) — 22

(77) 58

(78) $\frac{2}{15}$

(79) 1

***(80) 323 — 356**