The University Interscholastic League
Number Sense Test • HS B • 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) $213 + 314 + 2026 =$ _____

(2) $202.6 - 21.3 - 31.4 =$ _____ **(decimal)**

(3) $\frac{2}{13} \div \frac{3}{14} =$ _____

(4) $2\frac{1}{3} \times 3\frac{1}{4} =$ _____ **(mixed number)**

(5) Which is smaller $\frac{2}{13}$ or $\frac{3}{14}$? _____

(6) $\left[(26 - 13) + (26 - 12)\right]^2 =$ _____

(7) The GCD of 78 and 51 is _____

(8) $20 \times 13 + 20 \times 14 =$ _____

(9) $4 + 7 + 10 + ... + 31 + 34 =$ _____

***(10)** $21326 + 31426 - 2026 =$ _____

(11) $333 \times \frac{3}{37} =$ _____

(12) Given: {2, 1, 3, 2, 6, 3, 1, 4, 2, 6}. Find the sum of the median and the mode. _____

(13) The sum of the positive divisors of 26 is _____

(14) 1314×15 is _____

(15) $1495 \times 5 - 25 =$ _____

(16) $17 \times \frac{17}{21} =$ _____ **(mixed number)**

(17) $21^2 - 17^2 = 38 \times$ _____

(18) 0.75% = _____ **(fraction)**

(19) 2 dekagram = .7 oz. and 21 oz. = _____ **grams**

***(20)** $21.3 \times 31.4 + 2026 =$ _____

(21) $3\frac{1}{4} \times 8\frac{2}{3} =$ _____ **(mixed number)**

(22) {2, 13, 20, 26} ∪ {3, 14, 20, 26} contains how many distinct elments? _____

(23) $\sqrt[3]{2744} =$ _____

(24) 21% of 34 is _____ % of 238

(25) $\frac{9}{16} \div \frac{9}{64} \times \frac{9}{256} =$ _____

(26) $2x - 13 = 3x - 14$ and $x =$ _____

(27) The LCM of 78 and 51 is $78 \times$ _____

(28) 75 is 41.666...% of _____

(29) The sum of the prime numbers greater than 21 and less than 31 is _____

***(30)** $\sqrt{314213} =$ _____

(31) The 14^{th} term of the sequence 5, 10, 15, 20, ... is 70. The 13^{th} term is _____

(32) The additive inverse of 0.41666... is _____

(33) How many 4-digit numbers can be made using these five the digits 3, 1, 4, 2 and 6? _____

(34) If $\frac{13x-2}{13x+2} + \frac{13x+2}{13x-2} = 2 + \frac{B}{169x^2-4}$, then B = ___

(35) 46×46 = _____

(36) 314 = _____ 6

(37) The area of a rectangle with length 13 cm is 182 cm^2. Find its perimeter. _____ cm

(38) $\frac{3}{4} - \frac{16}{19}$ = _____

(39) $(13^3 + 14^3 - 26) \div 27$ has a remainder of _____

*(40) A half mile is _____ centimeters

(41) 22×82 = _____

(42) $\{2, 13, 20, 26\} \cap \{3, 14, 20, 26\}$ contains how many distinct elments? _____

(43) $\frac{23}{33}$ = 0.ababab... and b − a = _____

(44) If $\frac{1}{3} + \frac{1}{6} + \frac{1}{10} + ... + \frac{1}{n} = \frac{7}{9}$, then n = _____

(45) The hypotenuse of a 45°-45°-90° triangle is $\sqrt{50}$. The lengths of the other sides total _____

(46) Let $(2x + 3)(3x - 4) = ax^2 + bx + c$. Find a + b + c = _____

(47) If ${}_7P_2 = k \times ({}_7C_5)$, then k = _____

(48) $(4 + 3i)(2 + i) = a + bi$ and a + b = _____

(49) Let (− 3, 4) be the midpoint of the segment with endpoints (2, 6) and (x, y). Find x + y. _____

*(50) $5202 \times (213 - 314)$ = _____

(51) $2026_8 - (213_8 + 314)_8$ = _____ 8

(52) How many 4-digit numbers less than 4000 can be made using these four digits 1, 2, 3, and 4? _____

(53) The sum of the digits of a 3-digit number is 13. How many such numbers exist? _____

(54) A sock drawer contains 8 white and 5 brown socks. If the first sock drawn is brown what is the probability the second one is brown? _____

(55) $21331_6 \div 4_6$ has a remainder of _____ 6

(56) $2x^3 + 3x^2 - 3x - 2 = 0$ and P, Q, and R are the roots. Find PQR − (PQ + PR + QR). _____

(57) $\prod_{k=2}^{k=6} (k - 1)$ = _____

(58) The point (3, − 4) is reflected across the line $y = -x + 1$ to the point (h, k). Find h + k. _____

(59) $5^3 - 2$ = _____ 5

*(60) $\sqrt[3]{21331426}$ = _____

(61) $2x - y = 3$ and $3x - y = 4$. Find x. = _____

(62) $2 + 1 \div 3 - 3! \times (1 - 4) \times 2 \div 6$ = _____

(63) $\begin{vmatrix} 2 & 13 \\ 3 & 14 \end{vmatrix}$ = _____

(64) $43^{21} \div 22$ has a remainder of _____

(65) If 0.1444... base 8 = $\frac{a}{b}$ base 8, then a + b = _____

(66) The y-intercept of the line through points (2, 13) and (3, 14) is at y = _____

(67) If $\sec\theta = -4$, $\theta \in$ QII, then $\cos\theta$ = _____

(68) $\lceil \sqrt{10} - \sqrt{5} \rceil$ = _____

(69) 0.34_6 = _____ (fraction)

*(70) The volume of a rectangular prism with length 13 m, width 14 m, and height 27 m is _____ m^3

(71) If xy = 3 and x − y = 14 then $x^3 - y^3$ = _____

(72) 2133×14 = _____

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

(74) Find the slope of the tangent to $f(x) = 3x^2 - 3x - 4$ at x = 2. _____

(75) Let $f(x) = \frac{2x-13}{3}$. Find $f^{-1}(14)$. _____

(76) Let $f(x) = \frac{2x+13}{14-3x}$. The horizontal asymptote of f(x) is at y = _____

(77) $g(x) = 2x^3 + 13x^2 - 3x - 14$ and $g'(-1)$ = _____

(78) $\int_0^3 \int_3^4 (x - y)\, dxdy$ = _____

(79) 203×304 = _____

*(80) $(21303142026)^{\frac{1}{4}}$ = _____

University Interscholastic League - Number Sense Answer Key HS ● Invitation B ● 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) 2,553

(2) 149.9

(3) $\frac{28}{39}$

(4) $7\frac{7}{12}$

(5) $\frac{2}{13}$

(6) 729

(7) 3

(8) 540

(9) 209

***(10) 48,190 — 53,262**

(11) 27

(12) 4.5, $\frac{9}{2}$, $4\frac{1}{2}$

(13) 42

(14) 19,710

(15) 7,450

(16) $13\frac{16}{21}$

(17) 4

(18) $\frac{3}{400}$

(19) 600

***(20) 2,561 — 2,829**

(21) $28\frac{1}{6}$

(22) 6

(23) 14

(24) 3

(25) $\frac{9}{64}$

(26) 1

(27) 17

(28) 180

(29) 52

***(30) 533 — 588**

(31) 65

(32) $-\frac{5}{12}$

(33) 120

(34) 16

(35) 2,116

(36) 1242

(37) 54

(38) $-\frac{7}{76}$

(39) 1

***(40) 76,444 — 84,490**

(41) 1,804

(42) 2

(43) 3

(44) 36

(45) 10

(46) — 5

(47) 2

(48) 15

(49) — 6

***(50) — 551,673 — — 499,131**

(51) 1277

(52) 18

(53) 69

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

(55) 3

(56) $2.5, \frac{5}{2}, 2\frac{1}{2}$

(57) 120

(58) 3

(59) 443

***(60) 264 — 291**

(61) 1

(62) $\frac{25}{3}$, $8\frac{1}{3}$

(63) — 11

(64) 21

(65) 83

(66) 11

(67) — .25, $-\frac{1}{4}$

(68) 1

(69) $\frac{11}{18}$

***(70) 4,669 — 5,159**

(71) 2,870

(72) 29,862

(73) 1.25, $\frac{5}{4}$, $1\frac{1}{4}$

(74) 9

(75) 27.5, $\frac{55}{2}$, $27\frac{1}{2}$

(76) $-\frac{2}{3}$

(77) — 23

(78) 6

(79) 61,712

***(80) 363 — 401**