The University Interscholastic League
Number Sense Test • HS SAC • 2005

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 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) $2005 + 5002 =$ _____

(2) $2005 \div 5 =$ _____

(3) $\$50.02 - \$20.05 = \$$_____

(4) $\frac{2}{5} \times \frac{5}{2} =$ _____

(5) $2 + 3 \times 5 - 7 =$ _____

(6) $12\frac{1}{2}\% =$ _____ (fraction)

(7) $\frac{1}{16} =$ _____(decimal)

(8) $25^2 =$ _____

(9) $2005 \times 5 - 2005 =$ _____

*(10) $987 - 123 + 564 =$ _____

(11) $42 \times 24 =$ _____

(12) $2\frac{3}{5} - 7\frac{1}{10} =$ _____ (mixed number)

(13) Which is smaller, $\frac{7}{11}$ or $\frac{11}{13}$? = _____

(14) $\frac{1}{2} - \frac{1}{6} - \frac{1}{12} =$ _____ (proper fraction)

(15) $7 \times 7 \times 7 =$ _____

(16) $1 + 3 + 5 + \ldots + 19 =$ _____

(17) $\frac{3}{(2^3)(5)} =$ _____ (decimal)

(18) $16 \times \frac{16}{19} =$ _____ (mixed number)

(19) 32 is _____% of 80

*(20) $205 \times 502 =$ _____

(21) $6 \times 6\frac{5}{6} =$ _____

(22) .414141... = _____ (proper fraction)

(23) 13579 ÷ 9 has a remainder of _____

(24) The number of positive integral divisors of 36 is _____

(25) .5 — .25 — .125 = _____ (proper fraction)

(26) 32 ounces = _____ pints

(27) $200_5 =$ _____$_{10}$

(28) $\left(\sqrt{64} - \sqrt{36}\right)^5 =$ _____

(29) The product of 4 and x equals the sum of 4 and x. Find x. _____

*(30) $97531 \div 209 =$ _____

(31) 72% of 36 is 18% of _____

(32) $2 + 4 \times 6 - 8 \div 10 =$ _____

(33) $F(x) = 2x^2 - 3x - 4$. Evaluate F(5). _____

(34) The set {F, U, N} has _____ subsets

(35) $143 \times 49 =$ _____

(36) GCD(15,21) + LCM(15,21) = _____

(37) A ticket costs \$5.75. 12 tickets cost \$ _____

(38) $\sqrt[3]{512} \div \sqrt{64} =$ _____

(39) $5.3 \times 4.7 =$ _____ (decimal)

*(40) $\sqrt{25252} =$ _____

(41) $92 \times 93 =$ _____

(42) $30 \times 11 + 22 \times 15 =$ _____

(43) If the area of an equilateral triangle is $3\sqrt{3}$ square inches then its height is _____ inches

(44) $7\frac{1}{7}\% =$ _____ (proper fraction)

(45) $2 + 4 + 6 + 8 + \ldots + 44 =$ _____

(46) $7! \div 5! =$ _____

(47) If $3x + y = 8$ and $2x - y = 10$, then $x =$ _____

(48) A hexagon has _____ sides

(49) $66 \div .75 =$ _____

*(50) $8^3 \times 5^3 =$ _____

(51) $47^2 + 40^2 - 7^2 =$ _____

(52) $2 + 1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \ldots =$ _____

(53) $\tan(225°) =$ _____

(54) 12 % of $433\frac{1}{3}$ is _____

(55) $121 \times 411 =$ _____

(56) $53 \times 57 + 4 =$ _____

(57) The smallest integer such that $2x - 3 > 4$ is _____

(58) When two dice are tossed, the probability that the sum of the faces will be 3 is _____

(59) $\frac{4 \times 5! - 5 \times 4!}{4!} =$ _____

*(60) The perimeter of $90x^2 + 150y^2 = 13500$ is _____

(61) $444 \times \frac{5}{37} =$ _____

(62) $306^2 =$ _____

(63) $123_4 \div 3_4 =$ _____$_4$

(64) The slope of the line $3x + 4y - 5 = 0$ is _____

(65) $49^2 + 49 =$ _____

(66) $16^2 - 17^2 + 18^2 - 19^2 =$ _____

(67) $\sin[\sin^{-1}(\frac{1}{2})] =$ _____

(68) $2^3 \times 5^3 \times 7^3 =$ _____

(69) If $\sin\theta = -.1$, then $\csc\theta =$ _____

*(70) $4.8^3 \times 6.3^3 =$ _____

(71) $222 \times \frac{1}{27} =$ _____ (mixed number)

(72) If $g(x) = 3x + 2$, then $g^{-1}(-1) =$ _____

(73) The sum of the first nine terms of the Fibonacci sequence 2, 4, 6, 10, 16, ... is _____

(74) $13 \times \frac{13}{14} - 13 =$ _____

(75) $\frac{1}{3} + \frac{1}{6} + \frac{1}{10} =$ _____

(76) The maximum value of $\cos 3x - 2$ is _____

(77) The horizontal asymptote of $y = \frac{x+1}{x-1}$ is _____

(78) If $f(x) = 2x^2 - 3x + 4$, then $f'(-1) =$ _____

(79) $\int_0^1 \sqrt{x}\, dx =$ _____

*(80) $1250 \div 1666 \times 4444 =$ _____

University Interscholastic League - Number Sense Answer Key HS • SAC • Fall 2005

*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) 7007

(2) 401

(3) $ 29.97

(4) 1

(5) 10

(6) $\frac{1}{8}$

(7) .0625

(8) 625

(9) 8020

*(10) 1357 – 1499

(11) 1008

(12) $-4\frac{1}{2}$

(13) $\frac{7}{11}$

(14) $\frac{1}{4}$

(15) 343

(16) 100

(17) .075

(18) $13\frac{9}{19}$

(19) 40

*(20) 97765 – 108055

(21) 41

(22) $\frac{41}{99}$

(23) 7

(24) 9

(25) $\frac{1}{8}$

(26) 2

(27) 50

(28) 32

(29) $\frac{4}{3}$ or $1\frac{1}{3}$

*(30) 444 – 489

(31) 144

(32) 25.2, $25\frac{1}{5}$, $\frac{126}{5}$

(33) 31

(34) 8

(35) 7007

(36) 108

(37) $ 69.00

(38) 1

(39) 24.91

*(40) 151 – 166

(41) 8556

(42) 660

(43) 3

(44) $\frac{1}{14}$

(45) 506

(46) 42

(47) $\frac{18}{5}$ or $3\frac{3}{5}$ or 3.6

(48) 6

(49) 88

*(50) 60800 – 67200

(51) 3760

(52) 4

(53) 1

(54) 52

(55) 49731

(56) 3025

(57) 4

(58) $\frac{1}{18}$

(59) 15

*(60) 66 – 72

(61) 60

(62) 93636

(63) 21

(64) $-\frac{3}{4}$ or –.75

(65) 2450

(66) – 70

(67) $\frac{1}{2}$ or .5

(68) 343000

(69) – 10

*(70) 26271 – 29035

(71) $8\frac{2}{9}$

(72) – 1

(73) 284

(74) $-\frac{13}{14}$

(75) $\frac{3}{5}$

(76) – 1

(77) 1

(78) – 7

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

*(80) 3168 – 3501