

The University Interscholastic League

Number Sense Test • HS SAC • 2006

Contestant's Number _____

Read directions carefully
before beginning test

**DO NOT UNFOLD THIS SHEET
UNTIL TOLD TO BEGIN**

Final _____	_____
2nd _____	_____
1st _____	_____
Score _____	Initials _____

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.

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STOP -- WAIT FOR SIGNAL!

- | | |
|---|---|
| <p>(1) $7002 - 2007 =$ _____</p> <p>(2) $63 \times 11 =$ _____</p> <p>(3) $20.06 + 2.007 =$ _____ (decimal)</p> <p>(4) $\frac{2}{3} \div \frac{4}{5} =$ _____</p> <p>(5) $14 \times 41 =$ _____</p> <p>(6) $2006 \div 9 =$ _____ (mixed number)</p> <p>(7) $64\% =$ _____ (proper fraction)</p> <p>(8) $27 \times 25 =$ _____</p> <p>(9) $9 + 6 \div 3 - 3 \times 6 =$ _____</p> <p>*(10) $135 + 246 + 789 =$ _____</p> <p>(11) $15^2 =$ _____</p> <p>(12) $11^3 =$ _____</p> <p>(13) $7\frac{8}{9} - 1\frac{2}{3} =$ _____ (mixed number)</p> <p>(14) $4\frac{5}{6} + 2\frac{3}{4} =$ _____ (mixed number)</p> <p>(15) $23 \times 45 =$ _____</p> <p>(16) 26 is 65 % of what? _____</p> | <p>(17) Which is smaller, $\frac{2}{7}$ or .27 ? = _____</p> <p>(18) $4 + 8 + 12 + \dots + 44 =$ _____</p> <p>(19) $MMVII \div IX =$ _____ (Arabic Numeral)</p> <p>*(20) $1357 \times 2468 =$ _____</p> <p>(21) $246531 \div 4$ has a remainder of _____</p> <p>(22) .343434... = _____ (proper fraction)</p> <p>(23) 3 cups is what per cent of a quart? _____ %</p> <p>(24) $2007 =$ _____ 10</p> <p>(25) $.222\dots + .333\dots + .444\dots =$ _____</p> <p>(26) $(-27)^{\frac{1}{3}} =$ _____</p> <p>(27) If 6 pens cost 96¢ then 11 pens cost \$ _____</p> <p>(28) $14 \times 25 \times 36 =$ _____</p> <p>(29) Which of the following is a prime number, 51 or 67 ? _____</p> <p>*(30) 83% of 667 = _____</p> <p>(31) $13 \times 154 =$ _____</p> <p>(32) 48% of _____ is 16% of 24</p> |
|---|---|

(33) $4\frac{1}{4} \times 16\frac{1}{4} =$ _____ (mixed number)

(34) The number of distinct elements in $\{M, A, T, H\} \cup \{F, U, N\}$ is _____

(35) If $f(x) = x^2 - 4x + 4$ then $f(27)$ is _____

(36) 2 gallons equals _____ cubic inches

(37) $(23 \times 5 + 4) \div 7$ has a remainder of _____

(38) $44^2 - 45^2 =$ _____

(39) If 8 is to 15 as x is to 22.5, then $x =$ _____

*(40) $\sqrt{172839} =$ _____

(41) If $5x + 12 = 2$ then $2 - 12x =$ _____

(42) If the side of an equilateral triangle is 12 cm, then its area is $k\sqrt{3} \text{ cm}^2$. Find k . _____

(43) ..., -2.25, -1, x , 1.5, 2.75, ... is an arithmetic sequence. Find the value of x . _____

(44) A hexagon has _____ distinct diagonals.

(45) $24 \times 11 + 33 \times 8 =$ _____

(46) The sum of the roots of $3x^2 + 6x = 9$ is _____

(47) If $8^{(x+1)} = 512$ then $8^{(x-1)} =$ _____

(48) $64 \div .125 =$ _____

(49) If A is 20% less than B and B is 20% less than C , then A is what % less than C ? _____%

*(50) $21^3 \times 15^2 \div 9^4 =$ _____

(51) The largest integer such that $3x + 4 < -5$ is _____

(52) $(3 - 5i)(2 + 4i) = (a + bi)$. Find b . _____

(53) $\cos(-\frac{\pi}{3}) \times \cos(\frac{\pi}{3}) =$ _____

(54) $123 \times 301 =$ _____

(55) Find k , so that the four digit number 31k8 is divisible by 9. _____

(56) How many ordered pairs are in the Cartesian product of (a, b) and (a, b, c) ? _____

(57) An obtuse triangle has integer sides of 5, x , and 9. The smallest value of x is _____

(58) $71 \times 79 - 9 =$ _____

(59) If $\log_4 2 = k$ then $k =$ _____

*(60) $58333 \div 777 \times 75 =$ _____

(61) The sum of the coefficients of $(a - b)^2$ is _____

(62) The slope of the line $6x - 4y = -2$ is _____

(63) $22\frac{7}{8} \times 2\frac{7}{8} =$ _____

(64) $19^2 - 18^2 + 17^2 - 16^2 =$ _____

(65) $\frac{8}{11} - \frac{23}{34} =$ _____

(66) If $\sin \theta = -.5$, then $\csc \theta =$ _____

(67) $2 \sin \frac{5\pi}{12} \cos \frac{5\pi}{12} =$ _____

(68) How many minutes are there from 3:45 a.m. to 6:15 p.m. in one day? _____

(69) Find x , $0 \leq x \leq 6$, if $x + 2 \cong 9(\text{mod}7)$. _____

*(70) $323502 \div 1238 =$ _____

(71) The sum of the first eight terms of the Fibonacci sequence 3, 4, 7, 11, 18, ... is _____

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

(73) A number is randomly drawn from the set $\{1, 2, 3, 4, 5\}$. What is the probability that the number drawn is a prime number? _____%

(74) If $f(x) = 3x^4 - 5x + 6$, then $f'(1) =$ _____

(75) The amplitude of $4\cos 3(x + 1) - 2$ is _____

(76) Change .22 base 7 to a base 10 fraction. _____

(77) $111 \times \frac{4}{27} =$ _____ (mixed number)

(78) $\int_0^1 3x - 1 \, dx =$ _____

(79) $2 \times 3 \times 5 \times 7 =$ _____

*(80) $863 \div 6.25\% \times \frac{1}{2} =$ _____

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- | | |
|---|---|
| <p>(1) $7002 + 2007 =$ _____</p> <p>(2) $\frac{3}{4} \times \frac{8}{9} =$ _____</p> <p>(3) $20.07 - 2.007 =$ _____ (decimal)</p> <p>(4) $64 \div 25 =$ _____</p> <p>(5) $2007\% =$ _____ (mixed number)</p> <p>(6) $8 + 4 \times 2 - 4 \div 8 =$ _____</p> <p>(7) $\frac{5}{6} + \frac{7}{8} =$ _____ (improper fraction)</p> <p>(8) $297 \div 11 =$ _____</p> <p>(9) $31 \times 13 =$ _____</p> <p>*(10) $975 - 468 + 123 =$ _____</p> <p>(11) $11 \times 11 \times 11 \times 11 =$ _____</p> <p>(12) $2\frac{3}{4} - 6\frac{7}{8} =$ _____ (mixed number)</p> <p>(13) The additive inverse of -2.7 is _____</p> <p>(14) $18^2 =$ _____</p> <p>(15) 34 is 85 % of what? _____</p> <p>(16) Which is larger, $-.27$ or $-\frac{2}{7}$? = _____</p> <p>(17) $MIII + MIV =$ _____ (Arabic Numeral)</p> | <p>(18) $3 + 9 + 15 + \dots + 33 =$ _____</p> <p>(19) The GCD of 27 and 36 is _____</p> <p>*(20) $7532 \times 1468 =$ _____</p> <p>(21) $27 \times \frac{27}{32} =$ _____ (mixed number)</p> <p>(22) If 4 rulers cost \$1.50 then 14 rulers cost \$ _____</p> <p>(23) $214365 \div 8$ has a remainder of _____</p> <p>(24) What number divided by 5 and added to 20, gives the same results? _____</p> <p>(25) $.111\dots - .333\dots - .666\dots =$ _____</p> <p>(26) $21^2 + 7^2 =$ _____</p> <p>(27) 4 pints is what per cent of a gallon? _____ %</p> <p>(28) $15 \times 25 \times 16 =$ _____</p> <p>(29) Which of the following is a perfect number, 14, 28, or 42? _____</p> <p>*(30) 87% of 789 = _____</p> <p>(31) $385 \times 13 =$ _____</p> <p>(32) $54^2 - 55^2 =$ _____</p> <p>(33) 24% of 16 is _____ % of 48</p> |
|---|---|

- (34) The number of distinct elements in $\{M, E, N, T, A, L\} \cap \{M, A, T, H\}$ is _____
- (35) If $x = -1$ and $y = 2$ then $(x - y)(x^2 + xy + y^2) =$ _____
- (36) How many positive integers less than 9×8 are relatively prime to 9×8 ? _____
- (37) The product of the roots of $x^2 + 3x = 7$ is _____
- (38) $2^4 + 1 =$ _____ base 8
- (39) $25 \frac{2}{5} \times 5 \frac{2}{5} =$ _____
- *(40) $\sqrt[3]{730} \times \sqrt{80} \times 9 =$ _____
- (41) $35 \times 85 =$ _____
- (42) $(6)(5)(4!) - 5! =$ _____
- (43) A tetrahedron has _____ vertices
- (44) If A is 10% more than B and B is 10% less than C, then A is what % less than C? _____%
- (45) If $2^{(x+1)} = 32$ then $x - 1 =$ _____
- (46) The sum of the roots of $3x^3 + 2x^2 = 9$ is _____
- (47) ..., $-2\frac{1}{4}, 1\frac{1}{2}, x, \frac{2}{3}, \dots$ is a geometric sequence. Find the value of x . _____
- (48) $72 \times .08333\dots =$ _____
- (49) If the height of an equilateral triangle is 12", then its area is $4k\sqrt{3}$ sq. in. Find k . _____
- *(50) $24^2 \times 21^2 \div 3^4 =$ _____
- (51) The largest integer x such that $3x + 4 < -5$ is _____
- (52) 12 degrees $= \frac{\pi}{k}$ radians. Find k . _____
- (53) $62 \times 68 - 16 =$ _____
- (54) If $\log_k 32 = 5$ then $k =$ _____
- (55) $(3 - 5i)(3 - 5i) = a + bi$. Find $a + b$. _____
- (56) The hypotenuse of a 30° - 60° right triangle is 3 inches long. The shortest leg _____ inches
- (57) $\sin(-\frac{\pi}{6}) \times \cos(\frac{\pi}{3}) =$ _____
- (58) $311 \times 122 =$ _____
- (59) If the power set for A contains 32 elements, then A contains _____ elements.
- *(60) $48 \times 49 \times 50 =$ _____
- (61) $22_7 \times 4_7 =$ _____ ₇
- (62) $\frac{7}{15} - \frac{27}{61} =$ _____
- (63) The product of the coefficients of $(a - b)^2$ is _____
- (64) If $\cos \theta = -.25$, then $\sec \theta =$ _____
- (65) The slope of the line parallel to the line $2x - 3y = -4$ is _____
- (66) $(\sin 75^\circ)(\cos 75^\circ) =$ _____
- (67) Find x , $0 \leq x \leq 4$, if $x + 3 \cong 9(\text{mod}5)$. _____
- (68) $22^2 - 23^2 + 24^2 - 25^2 =$ _____
- (69) How many minutes are there from 8:00 a.m. to 3:45 p.m. in one day? _____
- *(70) $1^3 + 2^3 + 3^3 + \dots + 6^3 =$ _____
- (71) The sum of the first eight terms of the Fibonacci sequence 2, 5, 7, 12, 19, ... is _____
- (72) The amplitude of $y = 2 - 3\cos 4(x + 5)$ is _____
- (73) If $f(x) = 4x^3 - 3x^2 + 1$, then $f'(-1) =$ _____
- (74) Change .44 base 8 to a base 10 fraction. _____
- (75) If $f(x) = \frac{4x}{5}$, then $f^{-1}(2) =$ _____
- (76) $\log_3[\log_2(\log_2 256)] =$ _____
- (77) $2 \times 3 \times 5 \times 7 \times 11 =$ _____
- (78) $111 \times \frac{7}{27} =$ _____ (mixed number)
- (79) $\int_0^1 1 - x^2 dx =$ _____
- *(80) $456 \div 18.75\% \times \frac{1}{4} =$ _____

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|--|---|
| <p>(1) $2007 \times 6 + 2007 =$ _____</p> <p>(2) $\\$20.02 - \\$70.07 = \\$ _____</p> <p>(3) $63 \div \frac{3}{4} =$ _____</p> <p>(4) $21 \times 12 =$ _____</p> <p>(5) $\frac{11}{5} =$ _____ %</p> <p>(6) $\frac{6}{7} - \frac{7}{8} =$ _____</p> <p>(7) $18 + 15 \div 5 \times 9 =$ _____</p> <p>(8) $264 \div 22 =$ _____</p> <p>(9) $64 \times 75 =$ _____</p> <p>*(10) $2007 - 207 + 702 - 7002 =$ _____</p> <p>(11) $11^4 \div 11 =$ _____</p> <p>(12) $3\frac{4}{5} - 8\frac{9}{10} =$ _____ (mixed number)</p> <p>(13) The multiplicative inverse of -7.2 is _____</p> <p>(14) $6 + 12 + 18 + \dots + 66 =$ _____</p> <p>(15) 25% of 25 is _____ (decimal)</p> <p>(16) $22^2 =$ _____</p> <p>(17) $DCCII \div IX =$ _____ (Arabic Numeral)</p> | <p>(18) The LCM of 27 and 36 is _____</p> <p>(19) $.3222\dots =$ _____ (proper fraction)</p> <p>*(20) $\sqrt{272727} =$ _____</p> <p>(21) $8\frac{2}{3} \times 8\frac{1}{3} =$ _____ (mixed number)</p> <p>(22) What number subtracted from 7 and multiplied by 6, gives the same results? _____</p> <p>(23) $2057 \div 17 =$ _____</p> <p>(24) 2 quarts is what per cent of a pint? _____ %</p> <p>(25) $423156 \div 12$ has a remainder of _____</p> <p>(26) Which of the following is an abundant number, 14, 28, or 42? _____</p> <p>(27) $.777\dots - .333\dots + .555\dots =$ _____</p> <p>(28) $15 \times 25 \times 36 =$ _____</p> <p>(29) The square root of 27×48 is _____</p> <p>*(30) 106% of 319 = _____</p> <p>(31) $5\frac{1}{5} \times 25\frac{1}{5} =$ _____ (mixed number)</p> <p>(32) $48^2 - 49^2 =$ _____</p> <p>(33) 42% of 35 is 70% of _____</p> |
|--|---|

- (34) The number of distinct elements in $\{t, w, o\} \cup \{f, o, u, r\} \cap \{e, i, g, h, t\}$ is _____
- (35) If $f(x) = 4x^2 - 4x + 1$ then $f(13)$ is _____
- (36) $539 \times 13 =$ _____
- (37) The product of the positive divisors of 6 is _____
- (38) The ratio of the sides of a rectangle is 3:5. The perimeter is 32. The shorter side is _____
- (39) $5^4 \div 11$ has a remainder of _____
- *(40) $33 \times 44 \times 55 =$ _____
- (41) If $4x + 5 > 20$ then $x >$ _____
- (42) 123 base 4 equals _____ base 2
- (43) A pentagon has _____ distinct diagonals.
- (44) If $4^x = .0625$ then $x =$ _____
- (45) $32 \times 38 + 9 =$ _____
- (46) $911 \div .090909... =$ _____
- (47) Let R, S, and T be the roots of $2x^3 + 4x = 5$. $R \times S \times T$ equals _____
- (48) A is 10% less than B and B is 20% more than C. A is what % more than C? _____ %
- (49) The perimeter of an equilateral triangle is 12 cm. Its area is $k\sqrt{3} \text{ cm}^2$. Find k. _____
- *(50) $80520 \div 131 =$ _____
- (51) $(2 - 5i)(3 + 5i) = (a + bi)$. Find a. _____
- (52) $412 \times 112 =$ _____
- (53) An acute triangle has integer sides of 4, x, and 9. The largest value of x is _____
- (54) How many ordered pairs are in the Cartesian product of (a,b,c) and (d, e,)? _____
- (55) The smallest integer x such that $3 - 4x < 5$ is _____
- (56) $\frac{\pi}{18}$ radians = _____ degrees
- (57) $\sin(-\frac{\pi}{3}) \times \sin(\frac{\pi}{3}) =$ _____
- (58) If $\log_4(.5) = k$ then $k =$ _____
- (59) Find $k > 0$, so that the four digit number 567k is divisible by 6. _____
- *(60) $(75 \times 75) \div (25 \times 25 \times 25) \times 150 =$ _____
- (61) $31^2 - 33^2 + 35^2 - 37^2 =$ _____
- (62) $33_6 \times 3_6 =$ _____ 6
- (63) How much time has past from 2:15 p.m. to 11:30 p.m. in one day? _____ hours
- (64) $666 \times \frac{2}{37} =$ _____
- (65) $2(\cos 30^\circ)(\cos 30^\circ) - 1 =$ _____
- (66) The sum of the coefficients of $(x - y)^3$ is _____
- (67) $\frac{8}{9} - \frac{31}{37} =$ _____
- (68) $\log_5[\log_4(\log_3 81)] =$ _____
- (69) The slope of the line containing the points $(-4, 3)$ and $(3, -2)$ is _____
- *(70) $5^5 + 4^4 + 3^3 + 2^2 + 1^1 =$ _____
- (71) The sum of the first eleven terms of the Fibonacci sequence 2,4,6,10,16,26,... is _____
- (72) The period of $y = 5\cos \frac{1}{4}(x + 3\pi) + 2$ is $k\pi$ radians. Find k. _____
- (73) If $f(x) = 2 - 3x$, then $f^{-1}(1) =$ _____
- (74) If $f(x) = x^2 - 3x + 4$, then $f''(-1) =$ _____
- (75) $3 \times 5 \times 7 \times 11 =$ _____
- (76) Change .33 base 6 to a base 10 fraction. _____
- (77) $\frac{5}{6} + 1\frac{1}{5} - 2 =$ _____
- (78) $111 \times 35 =$ _____
- (79) $\int_0^4 \sqrt{x} \, dx =$ _____
- *(80) $797 \div 87.5\% \times \frac{7}{10} =$ _____

2006-07 TMSCA High School Number Sense Test 6

- (1) $702 - 207 =$ _____
- (2) $11 \times 54 =$ _____
- (3) $2.007 + 20.07 =$ _____ (decimal)
- (4) $\frac{3}{8} \div \frac{4}{9} =$ _____
- (5) $2007 \div 9$ has a remainder of _____
- (6) $64 \div 25 =$ _____ (decimal)
- (7) $\frac{1}{12} =$ _____ %
- (8) $5 - 4 \times 3 + 2 \div 1 =$ _____
- (9) $.35 \times 3.5 =$ _____ (decimal)
- *(10) $15301 + 7246 - 881 =$ _____
- (11) $21^2 =$ _____
- (12) $27 \times 72 =$ _____
- (13) Which is smaller, $-\frac{2}{7}$ or $-\frac{3}{8}$? _____
- (14) $2\frac{3}{5} + 4\frac{9}{10} =$ _____ (mixed number)
- (15) The LCM of 16, 20, and 32 is _____
- (16) 32 is 80 % of what? _____
- (17) $3\frac{4}{9} - 5\frac{1}{3} =$ _____ (mixed number)
- (18) $1 + 4 + 7 + 10 + \dots + 25 =$ _____
- (19) $\text{CCCLXXIV} \div \text{XI} =$ _____ (Arabic Numeral)
- *(20) $457689 \div 111 =$ _____
- (21) $(-12)^3 =$ _____
- (22) $.212121\dots =$ _____ (proper fraction)
- (23) Six tablespoons is _____ % of a cup
- (24) 200 base 10 equals _____ base 7
- (25) $\frac{2}{3} + \frac{5}{6} + \frac{8}{9} =$ _____ (mixed number)
- (26) $246531 \div 8$ has a remainder of _____
- (27) Which of the following is a deficient number, 40, 41, or 42? _____
- (28) $20.07 \times 1.1 =$ _____ (decimal)
- (29) 30 more than 40% of 50 is _____
- *(30) 106.25% of 640 = _____
- (31) $6\frac{1}{6} \times 12\frac{1}{6} =$ _____ (mixed number)
- (32) How many positive integral divisors does 81 have? _____
- (33) $123 \times 14 =$ _____

- (34) $(65 - 4 \times 3) \div 6$ has a remainder of _____
- (35) If $f(x) = x^2 - 6x + 9$ then $f(18)$ is _____
- (36) 2 cubic feet equals _____ cubic inches
- (37) The number of distinct elements in $\{m,a,t,h\} \cap \{e,m,a,t,i,c,s\}$ is _____
- (38) $22422 \div 101 =$ _____
- (39) $73^2 - 72^2 =$ _____
- *(40) $\sqrt{2007} \times \sqrt{2116} =$ _____
- (41) $(2! + 3!) \div 5! =$ _____
- (42) If $14 = 2x - 8$ then $14 + 2x =$ _____
- (43) $\dots, -\frac{3}{8}, \frac{1}{4}, -\frac{1}{6}, x, -\frac{2}{27}, \dots$ is a geometric sequence. The value of x is _____
- (44) The units digit of 13^{13} is _____
- (45) $48 \times 11 + 44 \times 12 =$ _____
- (46) The sum of the roots of $x^2 - 9 = 0$ is _____
- (47) If A is $\frac{4}{5}$ of B and B is $\frac{4}{5}$ of C , then A is what percent of C ? _____ %
- (48) A pentagon has _____ distinct diagonals
- (49) $\frac{8}{11} - \frac{31}{45} =$ _____
- *(50) $22^3 \times 33^2 \div 11^4 =$ _____
- (51) $213 \times 331 =$ _____
- (52) $(3 - 5i)(3 - 5i) = (a + bi)$. Find a . _____
- (53) $\cos(120^\circ) \times \cos(120^\circ) =$ _____
- (54) $3 - 1 - \frac{1}{3} - \frac{1}{9} - \frac{1}{27} - \dots =$ _____
- (55) ${}_6C_3 =$ _____
- (56) $49 \times 41 - 9 =$ _____
- (57) An obtuse triangle has integer sides of 7, x , and 8. The largest value of x is _____
- (58) If $\log_{16} 8 = w$ then $w =$ _____

- (59) Find k , so that the six digit number 23578k is divisible by 11. $k =$ _____
- *(60) $\frac{5}{37} \times 5548 =$ _____
- (61) The sum of the coefficients of $(a + b)^3$ is _____
- (62) The slope of the line $2y - 4 = -6x$ is _____
- (63) $22_6 + 33_6 + 44_6 =$ _____ $_6$
- (64) $[2 \sin \frac{\pi}{3} \cos \frac{\pi}{3}]^2 =$ _____
- (65) The determinant of $\begin{vmatrix} -3 & 4 \\ -a & 2 \end{vmatrix}$ is 5. Find a . _____
- (66) $606^2 =$ _____
- (67) The sum of the first nine terms of the Fibonacci sequence 3, 5, 8, 13, 21, ... is _____
- (68) How many minutes are there from 3:25 p.m. to 7:05 p.m. in one day? _____
- (69) Find x , $0 \leq x \leq 7$, if $x + 4 \cong 1(\text{mod}8)$. _____
- *(70) $887655 \div 4321 =$ _____
- (71) $333 \times \frac{1}{27} \times \frac{1}{37} =$ _____
- (72) A number is randomly drawn from the set $\{1,2,3,6,18\}$. The probability that the number drawn is not a prime number is _____ %
- (73) If $f(x) = 3x + 5x^2 - 7x^4$, then $f'(1) =$ _____
- (74) If $f(x) = x^2 - 1$ and $x > 0$, then $f^{-1}(8) =$ _____
- (75) The phase shift of $5\cos 4(x + 3) - 2$ is _____
- (76) $\frac{1}{3} + \frac{1}{6} + \frac{1}{10} + \frac{1}{15} =$ _____
- (77) $5^3 + 3^3 + 2^3 =$ _____
- (78) $\int_{-1}^2 4x \, dx =$ _____
- (79) The odds of drawing a red 7 from a standard 52-card deck is _____
- *(80) $369 \div 37\frac{1}{2}\% \times 1.2 =$ _____

2006-07 TMSCA High School Number Sense Test 12

- (1) $2007 - 7002 =$ _____
- (2) $\frac{5}{6} + \frac{3}{4} =$ _____ (mixed number)
- (3) $2007 \div 4 =$ _____ (decimal)
- (4) $2.5 \times 40.4 =$ _____
- (5) $3\frac{1}{4}\% =$ _____ (proper fraction)
- (6) $3 + 6 \times 9 \div 3 - 6 =$ _____
- (7) $14 \times 41 =$ _____
- (8) $(10)(11) + (11)(11) + (12)(11) =$ _____
- (9) $1\frac{3}{5} - 2.2 =$ _____
- *(10) $11235 + 81321 - 3455 =$ _____
- (11) $35 \times 35 =$ _____
- (12) $2\frac{5}{6} - 4\frac{2}{3} =$ _____ (mixed number)
- (13) The reciprocal of -3.25 is _____
- (14) $\frac{3^1}{(2^3)(5^2)} =$ _____ (decimal)
- (15) The GCD(16,20) — LCM(16,20) is _____
- (16) 14 is _____ % of 112
- (17) $MMVII \times XXV =$ _____ (Arabic Numeral)
- (18) $2 + 9 + 16 + \dots + 44 =$ _____
- (19) The mode of 1, 2, 1, 3, 2, 1, and 3 is _____
- *(20) $959 \times \sqrt{960} =$ _____
- (21) $563412 \div 6$ has a remainder of _____
- (22) $.2353535\dots =$ _____ (proper fraction)
- (23) A quart is what % of a cup? _____ %
- (24) $123_4 =$ _____ ₁₀
- (25) $.1666\dots + .333\dots + .8333\dots =$ _____
- (26) $18^2 - 6^2 =$ _____
- (27) $11 \times 18 \times 25 =$ _____
- (28) Which of the following is a deficient number, 56, 66, or 76? _____
- (29) What number taken away from 15 and multiplied by 6, gives the same results? _____
- *(30) 9.08% of 443322 = _____
- (31) $6006 \div 462 =$ _____
- (32) If the universal set $U = \{n, u, m, b, e, r, s\}$ and set $A = \{s, u, m\}$, then the complement of set A contains how many distinct elements? _____
- (33) $(34 \times 5 - 6) \div 7$ has a remainder of _____

- (34) 2541 cubic inches = _____ gallons
- (35) If $f(x) = 9x^2 + 12x + 4$ then $f(-2)$ is _____
- (36) How many positive integers less than 90 are relatively prime to 90? _____
- (37) The sum of the positive integral divisors of 28 is _____
- (38) $54843 \div 101 =$ _____
- (39) $8\frac{1}{8} \times 16\frac{1}{8} =$ _____ (mixed number)
- *(40) $\sqrt[3]{1329} \times \sqrt{171} \times 15 =$ _____
- (41) $7 \times 5! - 6! =$ _____
- (42) If A is $\frac{2}{3}$ of B and B is $\frac{3}{4}$ of C, then C is what percent of A? _____ %
- (43) An octahedron has _____ edges
- (44) If $4^x = .125$ then $4^{2x} =$ _____
- (45) $13 \times 55 + 11 \times 65 =$ _____
- (46) The sum of the roots of $2x^3 + 4x^2 - 3x + 5 = 0$ is _____
- (47) If $x + 2y = 3$ and $3x + 2y = 5$ then $x =$ _____
- (48) $32 \div .181818... =$ _____
- (49) Find the perimeter of an equilateral triangle whose area is $9\sqrt{3} \text{ cm}^2$. _____ cm
- *(50) $18^3 \times 15^3 \div 9^3 =$ _____
- (51) $321 \times 123 =$ _____
- (52) $i^{78} =$ _____
- (53) $\frac{3\pi}{5}$ radians equals k degrees. Find k. _____
- (54) $\tan(30^\circ) \times \cot(60^\circ) =$ _____
- (55) The ratio of x to y is 3:5. If $x + y = 24$ then the larger of x and y is _____
- (56) The supplement of a 47° angle is _____ $^\circ$
- (57) Find k, so that the 9 digit number 1482065k5 is divisible by 11. k = _____

- (58) $83 \times 87 - 21 =$ _____
- (59) If $\log_b 8 = 3$ then $b =$ _____
- *(60) $50^5 \div 25^5 \times 5^5 =$ _____
- (61) The product of the coefficients of $(a - b)^4$ is _____
- (62) The slope of the line containing the points $(-1, 1)$ and $(2, -2)$ is _____
- (63) How much time has passed from 4:54 p.m. to 5:00 p.m. the same day? _____ seconds
- (64) $24_7 \div 6_7 + 24_7 =$ _____ $_7$
- (65) The determinant of $\begin{vmatrix} 5 & 6 \\ a & 8 \end{vmatrix}$ is 9. Find a. _____
- (66) If $(5 - 2)! \cong x \pmod{5}$, where $0 \leq x \leq 5$, then $x =$ _____
- (67) $2 \sin 15^\circ \sin 75^\circ =$ _____
- (68) $\log_3 [\log_4 (\log_5 625)] =$ _____
- (69) The sum of the first eleven terms of the Fibonacci sequence 1,5,6,11,17,28, ... is _____
- *(70) $1428.57 \times 73 =$ _____
- (71) $444 \times \frac{4}{37} =$ _____
- (72) If $f(x) = \frac{8}{3+x}$, then $f^{-1}(2) =$ _____
- (73) If $f(x) = x^5 + x^3 - x$, then $f''(2) =$ _____
- (74) $\frac{1}{2} \times \frac{2}{3} \times \frac{4}{5} \times \frac{6}{7} =$ _____
- (75) The vertical displacement of $y = 5 \cos 4(x + 3) - 2$ is _____
- (76) A number is randomly drawn from the set $\{1,2,3,4,5\}$. What is the probability that the number drawn is a factor of 6? _____ %
- (77) The 5th pentagonal number is _____
- (78) 1.75 is to 9 as what is to 27? _____
- (79) $\int_0^4 (x - 1) dx =$ _____
- *(80) $818 \div 44\frac{4}{9}\% \times 12.5 =$ _____

2006-07 TMSCA High School State Meet

- (1) $2007 + 207 + 27 =$ _____
- (2) $70.02 - 2.07 =$ _____ (decimal)
- (3) $\frac{21}{22} \times \frac{2}{7} =$ _____
- (4) $297 \div 11 =$ _____
- (5) $15 \times 51 =$ _____
- (6) $\frac{3}{5} =$ _____ %
- (7) $19^2 =$ _____
- (8) $4 + 8 - 4 \div 8 \times 4 =$ _____
- (9) $321 \div 9 =$ _____ (mixed number)
- *(10) $7766 - 555 + 44 =$ _____
- (11) $3\frac{4}{5} + 8\frac{9}{10} =$ _____ (mixed number)
- (12) The reciprocal of 4.125 is _____
- (13) $88 + 80 + 72 + \dots + 8 =$ _____
- (14) What is 27% of 27? _____ (decimal)
- (15) The LCM of 24, 36, and 48 is _____
- (16) $XXVII \times CXI =$ _____ (Arabic Numeral)
- (17) $11^4 =$ _____
- (18) Which is larger, $-\frac{7}{2}$ or $-\frac{22}{7}$? = _____
- (19) $105 \times 95 =$ _____
- *(20) $97531 \div 246 =$ _____
- (21) $3\frac{1}{6} - 6\frac{1}{3} =$ _____ (mixed number)
- (22) 234 base 10 equals _____ base 5
- (23) Which of the following is a happy number, 9, 10, or 11? _____
- (24) $325476 \div 11$ has a remainder of _____
- (25) $.1666\dots - .333\dots + .8333\dots =$ _____
- (26) $27^2 + 9^2 =$ _____
- (27) 75% of a gallon is _____ pints
- (28) The median of 1, 3, 2, 7, 9, and 8 is _____
- (29) $11 \times 24 \times 25 =$ _____
- *(30) 87% of 5590 = _____
- (31) $462 \times 13 =$ _____
- (32) If 9 is to 14 as x is to 21, then x = _____
- (33) $42^2 - 44^2 =$ _____
- (34) If Universal set $U = \{2, 3, 5, 7, 9, 11, 13, 17, 19\}$ and set $A = \{3, 7, 13, 17\}$ then A' contains how many distinct elements? _____
- (35) 3 cubic yards equals _____ cubic feet

- (36) How many positive integral divisors does 144 have? _____
- (37) $(23 - 4 \times 5 + 6) \div 7$ has a remainder of _____
- (38) $11\frac{1}{11} \times 22\frac{1}{11} =$ _____ (mixed number)
- (39) If $f(x) = 9 - 12x + 4x^2$ then $f(1.5)$ is? _____
- *(40) $\sqrt{38527} =$ _____
- (41) $7! \div 6! - 5! =$ _____
- (42) The sum of the product of the roots taken two at a time of $2x^3 + 4x^2 - 6x = 8$ is _____
- (43) $54 \times 11 + 99 \times 6 =$ _____
- (44) If $4x + 6 = 2$ then $6x - 2 =$ _____
- (45) If A is 75% less than B and B is $\frac{1}{4}$ of C, then A is what fractional part of C? _____
- (46) If $n^4 = 49$ then $n^6 =$ _____
- (47) $55 \div .454545 \dots =$ _____
- (48) The area of a trapezoid with a height of 3" and bases of 5" and 7" is _____ sq. in.
- (49) If 1, x, 1.44, -1.728, ... is a geometric sequence then the value of x is _____
- *(50) $789123 \div 456 =$ _____
- (51) The sum of the coefficients of $(a - b)^4$ is _____
- (52) ${}^7C_4 =$ _____
- (53) $141 \times 114 =$ _____
- (54) $32_6 \div 5_6 \times 4_6 =$ _____₆
- (55) Find k, so that the five-digit number 5318k is divisible by 8. _____
- (56) Set P has 3 elements. The Cartesian product of set P and Q contains 12 ordered pairs. How many elements are in set Q? _____
- (57) $(4 - 3i)(2 - i) = (a + bi)$. Find $a - b$ _____
- (58) The smallest integer x such that $7x - 8 \geq 9$ is _____
- (59) The slope of the line perpendicular to the line $4x + 5y = -6$ is _____
- *(60) $54.5454 \times 66.6 \times 58 =$ _____
- (61) $(1 - \sin 60^\circ)(1 + \sin 60^\circ) =$ _____
- (62) The ratio of x to y is 7 to 4. If $x - y = 24$, then $x + y =$ _____
- (63) $4^1 - 4^0 + 4^{-1} - 4^{-2} + \dots =$ _____
- (64) An acute triangle has integer sides of 2, 7, and x. The largest integer value of x is _____
- (65) The sum of the first ten terms of the Fibonacci sequence 4, 5, 9, 14, 23, ... is _____
- (66) 630° equals $k\pi$ radians. Find k. _____
- (67) If $\log_b .5 = -.5$ then b = _____
- (68) How much time has passed from 8:30 a.m. to 3:45 p.m. the same day? _____ (hours)
- (69) If $(4x + 2)! \cong x(\text{mod } 7)$, where $0 \leq x \leq 6$, then x = _____
- *(70) $5714.28 \times 83 =$ _____
- (71) $999 \times \frac{7}{27} \times \frac{7}{37} =$ _____
- (72) If $f(x) = 4 - 3x$, then $f^{-1}(2) =$ _____
- (73) A number is randomly drawn from the set {1,2,3,4,5,6,7,8,9}. What are the odds that the number drawn is an odd number? _____
- (74) If $f(x) = 2x^3 - 4x^2 + 6x$, then $f'(1) =$ _____
- (75) The sixth hexagonal number is _____
- (76) $\frac{1}{2} + \frac{1}{5} + \frac{1}{10} + \frac{1}{15} =$ _____
- (77) The amplitude of $y = 2 - 5\cos 4(x-3)$ is _____
- (78) $\int_1^e \frac{2}{x} dx =$ _____
- (79) $6^3 + 4^3 + 2^3 =$ _____
- *(80) $438 \div 9\frac{1}{11} \% \times 11.1 =$ _____

The University Interscholastic League

Number Sense Test • HS District 1 • 2007

Contestant's Number _____

Read directions carefully
before beginning test

**DO NOT UNFOLD THIS SHEET
UNTIL TOLD TO BEGIN**

Final _____	_____
2nd _____	_____
1st _____	_____
Score _____	Initials _____

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!

- | | |
|---|--|
| <p>(1) $2700 - 720 =$ _____</p> <p>(2) $\frac{4}{5} \times \frac{5}{6} =$ _____</p> <p>(3) $200 \div 7 =$ _____ (mixed number)</p> <p>(4) $\\$17.97 + \\$12.48 = \\$ _____</p> <p>(5) $1.125 =$ _____ % (mixed number)</p> <p>(6) $\frac{7}{9} =$ _____ % (mixed number)</p> <p>(7) $24^2 =$ _____</p> <p>(8) $1 + 2 \times 3 \div 4 - 5 =$ _____</p> <p>(9) $61 \times 16 =$ _____</p> <p>*(10) $951 - 246 - 837 =$ _____</p> <p>(11) $11^5 \div 121 =$ _____</p> <p>(12) The GCD of 54 and 36 is _____</p> <p>(13) 31% of 31 is _____ (decimal)</p> <p>(14) $22 + 20 + 18 + \dots + 2 =$ _____</p> <p>(15) $5\frac{6}{7} - 12\frac{13}{14} =$ _____ (mixed number)</p> <p>(16) The reciprocal of .24 is _____</p> <p>(17) $.727272\dots =$ _____ (proper fraction)</p> | <p>(18) $96 \times 97 =$ _____</p> <p>(19) $\text{CCLXXX} \div \text{XIV} =$ _____ (Arabic Numeral)</p> <p>*(20) $\sqrt{1090} \times 31 =$ _____</p> <p>(21) $8\frac{1}{8} \times 16\frac{1}{8} =$ _____ (mixed number)</p> <p>(22) $651243 \div 6$ has a remainder of _____</p> <p>(23) If 6 pens cost \$.75 then 20 pens cost \$ _____</p> <p>(24) 9 cups is what per cent of a quart? _____ %</p> <p>(25) $13 \times 154 =$ _____</p> <p>(26) The number of distinct elements in $\{ \{f, i, v, e\} \cap \{s, i, x\} \} \cup \{t, e, n\}$ is _____</p> <p>(27) The range of 2, 11, 3, 9, 14, and 5 is _____</p> <p>(28) $15 \times 11 \times 25 =$ _____</p> <p>(29) Which of the following is a deficient number, 28, 66, or 85? _____</p> <p>*(30) 41.6% of 1438 = _____</p> <p>(31) $24^2 + 8^2 =$ _____</p> <p>(32) 243 cubic feet = _____ cubic yards</p> <p>(33) $.111\dots - .1666\dots - .333\dots =$ _____</p> |
|---|--|

- (34) If $x = -2$ and $y = -1$ then
 $(x - y)(x^2 + xy + y^2) =$ _____
- (35) $(2 \times 3^4 + 5^6) \div 7$ has a remainder of _____
- (36) $72 + 18 + 4 =$ _____ base 6
- (37) The sum of the roots of
 $(3x - 2)(2x + 1) = 0$ is _____
- (38) 48% of 64 is 96% of _____
- (39) $67^2 - 65^2 =$ _____
- *(40) $22 \times 44 \times 66 =$ _____
- (41) A nonagon has _____ distinct diagonals.
- (42) If $4 - 5x > 3$ then $x <$ _____
- (43) A is 25% more than B and B is 25% more than C. A is what % more than C? _____ %
- (44) $72 \times 11 + 99 \times 8 =$ _____
- (45) If $5^{(x-1)} = 3125$ then $x + 1 =$ _____
- (46) $242 \div .181818... =$ _____
- (47) The area of a trapezoid with bases of 3" and 4" is 14 sq. in. Its height is _____ in.
- (48) The units digit of 17^5 is _____
- (49) $2! \times 3! - 4! =$ _____
- *(50) $273849 \div 165 =$ _____
- (51) The product of the coefficients of $(a + b)^5$ is _____
- (52) $511 \times 212 =$ _____
- (53) Find $k > 0$, so that the five digit number 456k8 is divisible by 12. _____
- (54) If $\log_9 k = 2.5$ then $k =$ _____
- (55) $44_8 \times 4_8 =$ _____ 8
- (56) 216 degrees = $k\pi$ radians. Find k . _____
- (57) The shortest leg of a $30^\circ - 60^\circ - 90^\circ$ is $\frac{3}{4}$ " long. The hypotenuse is _____ inches

- (58) The Cartesian product of $\{1,2,3\}$ and set A contains 15 ordered pairs. The number of elements in set A is _____
- (59) $(2 - 5i)(3 - 4i) = (a + bi)$. Find $a - b$. _____
- *(60) $75^2 \div 25^3 \times 50^4 =$ _____
- (61) $79^2 - 76^2 + 73^2 - 70^2 =$ _____
- (62) If $(4!)(3!)(2!) \cong x \pmod{8}$, where $0 \leq x \leq 7$, then $x =$ _____
- (63) The sum of the coefficients of $(x + y)^6$ is _____
- (64) If $f(x) = 3x^3 - 2x^2 + x$, then $f''(1) =$ _____
- (65) The sum of the first nine terms of the Fibonacci sequence 4,7,11,18,29,... is _____
- (66) Change .66 base 12 to a base 10 fraction. _____
- (67) How much time has past from 3:45 p.m. to 4:00 p.m. in one day? _____ seconds
- (68) $\frac{8}{27} \times 111 =$ _____ (mixed number)
- (69) $\log_2[\log_3(\log_2 512)] =$ _____
- *(70) $5^1 + 4^2 + 3^3 + 2^4 + 1^5 =$ _____
- (71) The ratio of x to y is 4 to 7. If $x - y = -15$, then $x + y =$ _____
- (72) $2(\sin 15^\circ)(\cos 15^\circ) - 1 =$ _____
- (73) $\frac{1}{3} + \frac{1}{5} + \frac{1}{15} + \frac{1}{45} =$ _____
- (74) If $f(x) = 5 + 3x$, then $f^{-1}(-2) =$ _____
- (75) $2 \times 3 \times 11 \times 13 =$ _____
- (76) $\frac{10}{11} - \frac{39}{45} =$ _____
- (77) The 7th septagonal number is _____
- (78) $2^3 - 3^3 - 4^3 =$ _____
- (79) $\int_0^3 x^2 dx =$ _____
- *(80) $546 \div 45 \frac{5}{11} \times 10.8 =$ _____

The University Interscholastic League

Number Sense Test • HS District 2 • 2007

Contestant's Number _____

Final	_____
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!

- | | |
|---|---|
| <p>(1) $2007 \times 7 =$ _____</p> <p>(2) $\frac{4}{5} + \frac{6}{7} =$ _____ (mixed number)</p> <p>(3) $2007 \div 7 =$ _____ (mixed number)</p> <p>(4) $\\$27.97 - \\$7.02 = \\$ _____</p> <p>(5) $26\% =$ _____ (proper fraction)</p> <p>(6) $3\frac{1}{4}\% =$ _____ (decimal)</p> <p>(7) $456 \div 9 =$ _____ (mixed number)</p> <p>(8) $17^2 =$ _____</p> <p>(9) $2 - 3 \div 6 \times 4 + 5 =$ _____</p> <p>*(10) $777 - 864 - 222 =$ _____</p> <p>(11) $121 \times 121 =$ _____</p> <p>(12) $4\frac{5}{6} + 10\frac{11}{12} =$ _____ (mixed number)</p> <p>(13) $28^2 =$ _____</p> <p>(14) $106 \times 107 =$ _____</p> <p>(15) $27 \times 37 =$ _____</p> <p>(16) Which is larger, $-.375$ or $-\frac{5}{12}$? _____</p> <p>(17) $MCCLX \div XV =$ _____ (Arabic Numeral)</p> | <p>(18) The LCM of 63 and 45 is _____</p> <p>(19) 72 is x % of 400. Find x. _____ %</p> <p>*(20) $123456 \div 789 =$ _____</p> <p>(21) What number added to 5 and divided by 5, gives the same results? _____</p> <p>(22) $7\frac{1}{7} \times 49\frac{1}{7} =$ _____ (mixed number)</p> <p>(23) $1815 \div 15 =$ _____</p> <p>(24) $.08333... + .1666... + .25 =$ _____</p> <p>(25) If $f(x) = 25x^2 - 10x + 1$ then $f(4)$ is _____</p> <p>(26) $24^2 - 6^2 =$ _____</p> <p>(27) The sum of the positive divisors of 28 is _____</p> <p>(28) $11 \times 75 \times 24 =$ _____</p> <p>(29) 3 pints is what per cent of a cup? _____ %</p> <p>*(30) $39 \times 40 \times 41 =$ _____</p> <p>(31) $(1 + 2 - 3 \times 4^5) \div 6$ has a remainder of _____</p> <p>(32) $735246 \div 18$ has a remainder of _____</p> <p>(33) _____ % of 56 is 110 % of 28</p> <p>(34) $2^5 + 2 =$ _____ base 4</p> |
|---|---|

- (35) Which of the following is an extravagant number, 9, 10, or 11? _____
- (36) $4\frac{3}{5} \times 4\frac{2}{3} =$ _____ (mixed number)
- (37) The product of the roots of $(2x - 1)(3x + 2)(4x - 3) = 0$ is _____
- (38) If $U = \{n, u, m, b, e, r, s\}$, $A \subset U$, and $A = \{e, u\}$, then the complement of set A contains how many distinct elements? _____
- (39) $770 \times 13 =$ _____
- *(40) 248% of 687 = _____
- (41) $65 \times 95 =$ _____
- (42) $2! - 3! \times 5! =$ _____
- (43) An octagon has _____ distinct diagonals.
- (44) A is 25% less than B and B is 25% less than C. A is what % less than C? _____ %
- (45) $71 \times 79 + 16 =$ _____
- (46) If $n^6 = 1728$ then $n^4 =$ _____
- (47) Let R, S, and T be the roots of $2x^3 + 4x = 5$. $RS + RT + ST$ equals _____
- (48) ..., 2, x, .75, y, ... is an arithmetic sequence. Find the value of $x + y$. _____
- (49) The area of an equilateral triangle is $4\sqrt{3} \text{ cm}^2$. Its perimeter is _____ cm
- *(50) $24^3 \times 21^2 \div 4^4 =$ _____
- (51) ${}_7P_4 =$ _____
- (52) $151 \times 115 =$ _____
- (53) An obtuse triangle has integer sides of 6, x, and 11. The smallest value of x is _____
- (54) How many ordered pairs are in the Cartesian product of $\{1, 2, 3\}$ and $\{4, 5\}$? _____
- (55) The largest integer x such that $3 < 4 - 5x$ is _____
- (56) $12_4 \times 2_4 \div 3_4 =$ _____ 4
- (57) $\cos(-\frac{\pi}{3}) \times \cos(\frac{\pi}{3}) =$ _____
- (58) The slope of the line containing the points $(-1, 2)$ and $(-3, 4)$ is _____
- (59) Find $k > 0$, so that the six digit number 456k89 is divisible by 11. _____
- *(60) $416666 \div 555 \times 76 =$ _____
- (61) $888 \times \frac{4}{37} =$ _____
- (62) $111 \times 44 =$ _____
- (63) How many minutes will pass from 9:15 p.m. to 2:00 a.m. the next day? _____ minutes
- (64) Find k, $0 \leq k \leq 7$, if $\frac{(5!)(3!)}{(4!)} \cong k(\text{mod } 8)$. _____
- (65) Change .202 base 5 to a base 10 fraction. _____
- (66) The sum of the coefficients of $(x + y)^2$ is _____
- (67) The phase shift of $f(x) = 2 \sin(3x - \frac{\pi}{2})$ is $k\pi$ radians. Find k. _____
- (68) If $f(x) = \frac{3 - 2x}{4}$, then $f^{-1}(-1) =$ _____
- (69) The sum of the first twelve terms of the Fibonacci sequence 1, 2, 3, 5, 8, 13, 21, ... is _____
- *(70) $1^3 + 2^3 + 3^3 + 4^3 + \dots + 8^3 =$ _____
- (71) $(\sin \frac{\pi}{3} - \cos \frac{\pi}{3})(\sin \frac{\pi}{3} + \cos \frac{\pi}{3}) =$ _____
- (72) $\log_3[\log_4(\log_5 625)] =$ _____
- (73) If $f(x) = 4x^3 - 3x^2 + x$, then $f'(-1) =$ _____
- (74) 2.25 is to 9 as 1.5 is to ? _____
- (75) $666 \times \frac{16}{27} \times \frac{24}{37} =$ _____
- (76) $i^{66} =$ _____
- (77) $\int_0^2 x^3 dx =$ _____
- (78) $3^4 - 6^3 - 9^2 =$ _____
- (79) The 8th octagonal number is _____
- *(80) $888 \times 87.5\% \div \frac{7}{11} =$ _____

The University Interscholastic League

Number Sense Test • HS Regional • 2007

Contestant's Number _____

Final	_____
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!

- | | |
|--|--|
| <p>(1) $7020 - 2070 =$ _____</p> <p>(2) $11 \times 72 =$ _____</p> <p>(3) $200.7 + 70.02 =$ _____ (decimal)</p> <p>(4) $72 \div 27 =$ _____ (mixed number)</p> <p>(5) $2\frac{3}{5}\% =$ _____ (proper fraction)</p> <p>(6) $\frac{1}{16} =$ _____ %</p> <p>(7) $23^2 =$ _____</p> <p>(8) $9 - 7 \times 5 \div 3 + 1 =$ _____</p> <p>(9) $\frac{4}{9} \div \frac{8}{15} =$ _____</p> <p>*(10) $789 - 3120 + 645 =$ _____</p> <p>(11) $11^3 - 11^2 =$ _____</p> <p>(12) $4\frac{7}{8} - 12\frac{23}{24} =$ _____ (mixed number)</p> <p>(13) The reciprocal of -1.0625 is _____</p> <p>(14) 31% of 31 is _____ (decimal)</p> <p>(15) $7 + 14 + 21 + \dots + 77 =$ _____</p> <p>(16) Which is larger, $-\frac{6}{11}$ or $-\frac{5}{9}$? _____</p> <p>(17) MC + DL + XIV = _____ (Arabic Numeral)</p> | <p>(18) 63 is _____ % of 105</p> <p>(19) The GCD of 132 and 156 is _____</p> <p>*(20) $\sqrt{32323} =$ _____</p> <p>(21) $112358 \div 6$ has a remainder of _____</p> <p>(22) 430 base 10 equals _____ base 5</p> <p>(23) If 30 pens cost \$3.50 then 9 pens cost \$ _____</p> <p>(24) $.75 - .25 - .0625 =$ _____ (proper fraction)</p> <p>(25) 3 pints is what per cent of a gallon? _____ %</p> <p>(26) Which of the following is a happy prime number, 13, 11, or 9? _____</p> <p>(27) $33^2 + 11^2 =$ _____</p> <p>(28) $75 \times 15 \times 48 =$ _____</p> <p>(29) What number multiplied by 8 and taken away from 36, gives the same results? _____</p> <p>*(30) 63% of 7191 = _____</p> <p>(31) 4,320 cubic inches = _____ cubic feet</p> <p>(32) $(6 + 5 - 4 \times 3^2) \div 7$ has a remainder of _____</p> <p>(33) $7\frac{1}{7} \times 14\frac{1}{7} =$ _____ (mixed number)</p> <p>(34) If $f(x) = x^2 - 10x + 25$ then $f(23)$ is _____</p> |
|--|--|

- (35) The number of distinct elements in $\{z, e, r, o\} \cap \{o, n, e\} \cup \{t, w, o\}$ is _____
- (36) $143 \times 77 =$ _____
- (37) The sum of the positive integral divisors of $3 \times 5 \times 7$ is _____
- (38) $8! \div 6! - 4! =$ _____
- (39) $72^2 - 78^2 =$ _____
- *(40) $42 \times 45 \times 48 =$ _____
- (41) If $3x - 1 = 2 + 4x$, then $5x - 6 =$ _____
- (42) ..., .25, — .15, .09, x, .0324, ... is a geometric sequence. The value of x is _____
- (43) A dodecahedron is a Platonic solid with 30 edges and _____ vertices
- (44) If $9^x = 243$ then $x =$ _____
- (45) $13 \times 77 + 91 \times 11 =$ _____
- (46) If A is 25% more than B and B is $\frac{1}{3}$ of C, then C is what % of A? _____ %
- (47) $363 \div .272727... =$ _____
- (48) $\frac{13}{15} + \frac{2}{13} =$ _____ (mixed number)
- (49) The sum of the roots of $4x^2 + 3x = 2$ is _____
- *(50) $21^3 \times 18^2 \div 9^3 =$ _____
- (51) The smallest integer x such that $5 - 4x < -3$ is _____
- (52) $223 \times 112 =$ _____
- (53) $\frac{5\pi}{8}$ radians equals _____ degrees
- (54) $23_6 + 45_6 - 50_6 =$ _____ $_6$
- (55) If $\log_4 8 = k$ then $k =$ _____
- (56) $\cos(-\frac{2\pi}{3}) \times \cos(\frac{4\pi}{3}) =$ _____
- (57) An acute triangle has integer side lengths of 7, 11, and x. The smallest value of x is _____
- (58) Find k, so that the seven digit number 377337k is divisible by 11. $k =$ _____
- (59) $(2 + 7i)(2 - 7i) = a + bi$. Find $a + b$. _____
- *(60) $75^4 \div 50^3 \times 25^2 =$ _____
- (61) The product of the coefficients of $(a + b)^5$ is _____
- (62) $5^1 - 5^0 + 5^{-1} - 5^{-2} + \dots =$ _____
- (63) If $f(x) = x^3 - 3x^2 + 5x$, then $f''(2) =$ _____
- (64) Find k, $0 \leq k \leq 8$, if $\frac{(5!)(4!)}{(3!)} \cong k \pmod{9}$. _____
- (65) $\frac{11}{16} - \frac{32}{49} =$ _____
- (66) $(707)^2 =$ _____
- (67) The slope of the line containing points $(2, -3)$ and $(3, -2)$ is _____
- (68) $\log_4[\log_3(\log_5 125)] =$ _____
- (69) The sum of the first eleven terms of the Fibonacci sequence 2,5,7,12,19,31, ... is _____
- *(70) $7142.85 \times 34.2 =$ _____
- (71) $\frac{1}{12} + \frac{1}{20} + \frac{1}{30} + \frac{1}{42} =$ _____
- (72) $(\sin \frac{\pi}{6} - \cos \frac{\pi}{6})(\sin \frac{\pi}{6} + \cos \frac{\pi}{6}) =$ _____
- (73) The odds of randomly drawing a prime number from the set {1,2,3,4,5} is _____
- (74) If $f(x) = \frac{x^3}{3} + 3$ then $f^{-1}(-6) =$ _____
- (75) Change .55 base 6 to a base 10 fraction. _____
- (76) $2 \times 3 \times 5 \times 7 \times 11 =$ _____
- (77) The 8th octagonal number is _____
- (78) $\int_1^e \frac{-3}{x} dx =$ _____
- (79) $3^3 - 4^3 - 2^3 + 5^3 =$ _____
- *(80) $8888 \times 62.5\% \times \frac{5}{11} =$ _____

The University Interscholastic League

Number Sense Test • HS State • 2007

Contestant's Number _____

Read directions carefully
before beginning test

**DO NOT UNFOLD THIS SHEET
UNTIL TOLD TO BEGIN**

Final	_____
2nd	_____
1st	_____
Score	Initials

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.

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- | | |
|--|--|
| <p>(1) $2007 \times 5 - 2008 =$ _____</p> <p>(2) $\frac{2}{3} + \frac{4}{5} =$ _____</p> <p>(3) $200.2 - 700.7 =$ _____ (decimal)</p> <p>(4) $77 \div 22 =$ _____ (mixed number)</p> <p>(5) $3\frac{5}{8} =$ _____ % (decimal)</p> <p>(6) $2 - 4 \times 6 \div 8 + 10 =$ _____</p> <p>(7) $34^2 =$ _____</p> <p>(8) $96 \div 75 =$ _____</p> <p>(9) $18 \times 81 =$ _____</p> <p>*(10) $323 - 5445 + 7667 =$ _____</p> <p>(11) $11^5 \div 121 =$ _____</p> <p>(12) $4\frac{5}{6} - 10\frac{11}{12} =$ _____ (mixed number)</p> <p>(13) The multiplicative inverse of -1.4 is _____</p> <p>(14) $102 \times 108 =$ _____</p> <p>(15) $24 \times 35 =$ _____</p> <p>(16) Which is larger, $.622$ or $\frac{5}{8}$? _____</p> <p>(17) $.818181... =$ _____ (proper fraction)</p> | <p>(18) $121 + 110 + 99 + ... + 11 =$ _____</p> <p>(19) The LCM of 57 and 95 is _____</p> <p>*(20) $753461 \div 289 =$ _____</p> <p>(21) $1324354 \div 4$ has a remainder of _____</p> <p>(22) 540 base 10 equals _____ base 6</p> <p>(23) $5\frac{1}{5} \times 10\frac{1}{5} =$ _____ (mixed number)</p> <p>(24) What number added to 15 and multiplied by 4 gives the same results? _____</p> <p>(25) Which of the following is an extravagant number, 2, 3, or 4? _____</p> <p>(26) $8^2 + 24^2 =$ _____</p> <p>(27) $.333... - .666... - .999... =$ _____</p> <p>(28) $21 \times 15 \times 14 =$ _____</p> <p>(29) The median of 13, 2, 10, 5, 17, and 8 is _____</p> <p>*(30) 123% of 882 = _____</p> <p>(31) $76^2 - 74^2 =$ _____</p> <p>(32) $(8^2 + 4 \times 6 - 10) \div 3$ has a remainder of _____</p> <p>(33) The number of distinct elements in $[\{m,e,d,i,a,n\} \cap \{m,e,a,n\}] \cap \{m,o,d,e\}$ is _____</p> |
|--|--|

(34) If $f(x) = (x + 7)(x^2 - 7x + 49)$
then $f(7) =$ _____

(35) $243 + 27 + 3 =$ _____ base 9

(36) How many positive integers less than
 16×25 are relatively prime to 16×25 ? _____

(37) $143 \times 63 =$ _____

(38) The sum of the roots of $x^3 - 13x = 12$ is _____

(39) 5 gallons equals _____ cubic inches

*(40) $52 \times 55 \times 58 =$ _____

(41) A decagon has _____ distinct diagonals.

(42) $\frac{(5!)(4!)}{6!} =$ _____

(43) If $5x - 3 = 4 + 2x$, then $6x + 1 =$ _____

(44) If A is 12.5% of B and B is $\frac{4}{5}$ of C, then C is
what % of A? _____%

(45) $12 \times 90 + 72 \times 15 =$ _____

(46) $1.21 \div .090909... =$ _____ (decimal)

(47) The ratio of the area of a circle with a radius
of 5 cm to its circumference is _____ cm

(48) $55 \times 95 =$ _____

(49) 101011 base 2 can be written as _____ base 4

*(50) $24^2 \times 18^3 \div 6^4 =$ _____

(51) The largest integer x such that
 $5x + 3 < -1$ is _____

(52) $114 \times 121 =$ _____

(53) Find $k > 4$, so that the six digit number
3576k2 is divisible by 12. $k =$ _____

(54) If $\log_4(.125) = k$ then $k =$ _____

(55) 1.25π radians equals _____ degrees

(56) $23_5 \times 4_5 - 10_5 =$ _____ $_5$

(57) $21 - 83 \times 87 =$ _____

(58) An obtuse triangle has integer side lengths
of 8, 15, and x. The smallest value of x is _____

(59) The sum of the coefficients of $(a + b)^5$ is _____

*(60) $\sqrt[3]{3380} \times \sqrt{223} \times 16 =$ _____

(61) $48^2 - 44^2 + 40^2 - 36^2 =$ _____

(62) $33 \times 1111 =$ _____

(63) The slope of the line $6 = 7y + 8x$ is _____

(64) Find k, $0 \leq k \leq 7$, if $(5!)(3!) \cong k \pmod{8}$. _____

(65) The sum of the first nine terms of the
Fibonacci sequence 3,8,11,19, ... is _____

(66) $(\sin 105^\circ)(\cos 105^\circ) =$ _____

(67) $\frac{8}{11} - \frac{87}{122} =$ _____

(68) If $g(x) = 2 - \frac{3x}{4}$, then $g^{-1}(5) =$ _____

(69) How many minutes are there from 6:54 a.m.
to 4:56 p.m. in one day? _____

*(70) $85714.2 \div 714.285 =$ _____

(71) The ratio of x to y is 4 to 9. If $x - y = -15$,
then $x + y =$ _____

(72) The period of $y = 2 - 3\cos(4\pi x + 2\pi)$ is _____

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

(74) $888 \times \frac{16}{37} \times \frac{18}{27} =$ _____

(75) Change .444 base 5 to a base 10 fraction. _____

(76) The 5th pentagonal number is _____

(77) $\frac{1}{72} + \frac{1}{90} + \frac{1}{110} + \frac{1}{132} =$ _____

(78) $5^3 - 4^3 + 3^3 - 2^3 =$ _____

(79) $\int_0^3 (2x + 1) dx =$ _____

*(80) $8333 \times 12\frac{1}{2}\% \times .12 =$ _____

University Interscholastic League - Number Sense Answer Key HS • SAC • Fall 2006

*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) 4995 | (17) .27 or $\frac{27}{100}$ | (33) $69\frac{1}{16}$ | (57) 5 |
| (2) 693 | (18) 264 | (34) 7 | (58) 5600 |
| (3) 22.067 | (19) 223 | (35) 625 | (59) .5 or $\frac{1}{2}$ |
| (4) $\frac{5}{6}$ | *(20) 3,181,623 — 3,516,529 | (36) 462 | *(60) 5350 — 5912 |
| (5) 574 | (21) 3 | (37) 0 | (61) 0 |
| (6) $222\frac{8}{9}$ | (22) $\frac{34}{99}$ | (38) — 89 | (62) 1.5, $\frac{3}{2}$, $1\frac{1}{2}$ |
| (7) $\frac{16}{25}$ | (23) 75 | (39) 12 | (63) 44 |
| (8) 675 | (24) 98 | *(40) 395 — 436 | (64) 70 |
| (9) — 7 | (25) 1 | (41) 26 | (65) $\frac{19}{374}$ |
| *(10) 1112 — 1228 | (26) — 3 | (42) 36 | (66) — 2 |
| (11) 225 | (27) \$1.76 | (43) .25 or $\frac{1}{4}$ | (67) .5 or $\frac{1}{2}$ |
| (12) 1331 | (28) 12600 | (44) 9 | (68) 870 |
| (13) $6\frac{2}{9}$ | (29) 67 | (45) 528 | (69) 0 |
| (14) $7\frac{7}{12}$ | *(30) 526 — 581 | (46) — 2 | *(70) 249 — 274 |
| (15) 1035 | (31) 2002 | (47) 8 | (71) 195 |
| (16) 40 | (32) 8 | (48) 512 | (72) 1 |
| | | (49) 36 | (73) 60 |
| | | *(50) 302 — 333 | (74) 7 |
| | | (51) — 4 | (75) 4 |
| | | (52) 2 | (76) $\frac{16}{49}$ |
| | | (53) .25 or $\frac{1}{4}$ | (77) $16\frac{4}{9}$ |
| | | (54) 37023 | (78) .5 or $\frac{1}{2}$ |
| | | (55) 6 | (79) 210 |
| | | (56) 6 | *(80) 6559 — 7249 |

University Interscholastic League - Number Sense Answer Key HS • Invitation A • 2007

*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) 9009 | (18) 108 | (34) 3 | (57) $-.25, -\frac{1}{4}$ |
| (2) $\frac{2}{3}$ | (19) 9 | (35) -9 | (58) 37942 |
| (3) 18.063 | *(20) 10,504,128 – 11,609,824 | (36) 24 | (59) 5 |
| (4) 2.56 | (21) $22\frac{25}{32}$ | (37) -7 | *(60) 111720 – 123480 |
| (5) $20\frac{7}{100}$ | (22) 5.25 | (38) 21 | (61) 121 |
| (6) 15.5, $15\frac{1}{2}, \frac{31}{2}$ | (23) 5 | (39) $137.16, 137\frac{4}{25}, \frac{3429}{25}$ | (62) $\frac{22}{915}$ |
| (7) $\frac{41}{24}$ | (24) -25 | *(40) 689 – 761 | (63) -2 |
| (8) 27 | (25) $-\frac{8}{9}$ | (41) 2975 | (64) -4 |
| (9) 403 | (26) 490 | (42) 600 | (65) $\frac{2}{3}$ |
| *(10) 599 – 661 | (27) 50 | (43) 4 | (66) $.25, \frac{1}{4}$ |
| (11) 14641 | (28) 6000 | (44) 1 | (67) 1 |
| (12) $-4\frac{1}{8}$ | (29) 28 | (45) 3 | (68) -94 |
| (13) 2.7, $2\frac{7}{10}, \frac{27}{10}$ | *(30) 653 – 720 | (46) $-\frac{2}{3}$ | (69) 465 |
| (14) 324 | (31) 5005 | (47) -1 | *(70) 419 – 463 |
| (15) 40 | (32) -109 | (48) 6 | (71) 207 |
| (16) $-.27, -\frac{27}{100}$ | (33) 8 | (49) 12 | (72) 3 |
| (17) 2007 | | *(50) 2980 – 3292 | (73) 18 |
| | | (51) -4 | (74) $\frac{9}{16}$ |
| | | (52) 15 | (75) $2.5, 2\frac{1}{2}, \frac{5}{2}$ |
| | | (53) 4200 | (76) 1 |
| | | (54) 2 | (77) 2310 |
| | | (55) -46 | (78) $28\frac{7}{9}$ |
| | | (56) $1.5, 1\frac{1}{2}, \frac{3}{2}$ | (79) $\frac{2}{3}$ |
| | | | *(80) 578 – 638 |

University Interscholastic League - Number Sense Answer Key HS • Invitation B • 2007

*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) 14049 | (18) 108 | (34) 1 | (57) $-.75, -\frac{3}{4}$ |
| (2) -50.05 | (19) $\frac{29}{90}$ | (35) 625 | (58) $-.5, -\frac{1}{2}$ |
| (3) 84 | *(20) $497 - 548$ | (36) 7007 | (59) 6 |
| (4) 252 | (21) $72\frac{2}{9}$ | (37) 36 | *(60) $52 - 56$ |
| (5) 220 | (22) 1 | (38) 6 | (61) -272 |
| (6) $-\frac{1}{56}$ | (23) 121 | (39) 9 | (62) 143 |
| (7) 45 | (24) 400 | *(40) $75867 - 83853$ | (63) $9.25, 9\frac{1}{4}, \frac{37}{4}$ |
| (8) 12 | (25) 0 | (41) $3.75, 3\frac{3}{4}, \frac{15}{4}$ | (64) 36 |
| (9) 4800 | (26) 42 | (42) 11011 | (65) $.5, \frac{1}{2}$ |
| *(10) $(-4725) - (-4275)$ | (27) 1 | (43) 5 | (66) 0 |
| (11) 1331 | (28) 13500 | (44) -2 | (67) $\frac{17}{333}$ |
| (12) $-5\frac{1}{10}$ | (29) 36 | (45) 1225 | (68) 0 |
| (13) $-\frac{5}{36}$ | *(30) $322 - 355$ | (46) 10021 | (69) $-\frac{5}{7}$ |
| (14) 396 | (31) $131\frac{1}{25}$ | (47) $2.5, 2\frac{1}{2}, \frac{5}{2}$ | *(70) $3243 - 3583$ |
| (15) 6.25 | (32) -97 | (48) 8 | (71) 750 |
| (16) 484 | (33) 21 | (49) 4 | (72) 8 |
| (17) 78 | | *(50) $584 - 645$ | (73) $\frac{1}{3}$ |
| | | (51) 31 | (74) 2 |
| | | (52) 46144 | (75) 1155 |
| | | (53) 9 | (76) $\frac{7}{12}$ |
| | | (54) 6 | (77) $\frac{1}{30}$ |
| | | (55) 0 | (78) 3885 |
| | | (56) 10 | (79) $5\frac{1}{3}, \frac{16}{3}$ |
| | | | *(80) $606 - 669$ |

2006-07 TMSCA High School Number Sense Test 6 - Answer Key

*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) 495 | (18) 117 | (34) 5 | (59) 5 |
| (2) 594 | (19) 34 | (35) 225 | *(60) 713 — 787 |
| (3) 22.077 | *(20) 3918 — 4329 | (36) 3456 | (61) 8 |
| (4) .84375, $\frac{27}{32}$ | (21) — 1728 | (37) 3 | (62) — 3 |
| (5) 0 | (22) $\frac{7}{33}$ | (38) 222 | (63) 143 |
| (6) 2.56 | (23) 37.5, $37\frac{1}{2}$ | (39) 145 | (64) .75, $\frac{3}{4}$ |
| (7) $\frac{25}{3}$, $8\frac{1}{3}$ | (24) 404 | *(40) 1958 — 2163 | (65) 2.75, $\frac{11}{4}$, $2\frac{3}{4}$ |
| (8) — 5 | (25) $2\frac{7}{18}$ | (41) $\frac{1}{15}$ | (66) 367236 |
| (9) 1.225 | (26) 3 | (42) 36 | (67) 372 |
| *(10) 20583 — 22749 | (27) 41 | (43) $\frac{1}{9}$ | (68) 220 |
| (11) 441 | (28) 22.077 | (44) 3 | (69) 5 |
| (12) 1944 | (29) 50 | (45) 1056 | *(70) 196 — 215 |
| (13) — $\frac{3}{8}$ | *(30) 646 — 714 | (46) 0 | (71) $\frac{1}{3}$ |
| (14) $7\frac{1}{2}$ | (31) $75\frac{1}{36}$ | (47) 64 | (72) 60 |
| (15) 160 | (32) 5 | (48) 5 | (73) — 15 |
| (16) 40 | (33) 1722 | (49) $\frac{19}{495}$ | (74) 3 |
| (17) — $1\frac{8}{9}$ | | *(50) 753 — 831 | (75) — 3 |
| | | (51) 70503 | (76) $\frac{2}{3}$ |
| | | (52) — 16 | (77) 160 |
| | | (53) .25, $\frac{1}{4}$ | (78) 6 |
| | | (54) 1.5, $\frac{3}{2}$, $1\frac{1}{2}$ | (79) .04, $\frac{1}{25}$ |
| | | (55) 20 | *(80) 1122 — 1239 |
| | | (56) 2000 | |
| | | (57) 14 | |
| | | (58) .75, $\frac{3}{4}$ | |

2006-07 TMSCA High School Number Sense Test 12 - Answer Key

*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) — 4995 | (18) 161 | (34) 11 | (58) 7200 |
| (2) $1\frac{7}{12}$ | (19) 1 | (35) 16 | (59) 2 |
| (3) 501.75 | *(20) 28228 — 31199 | (36) 24 | *(60) 95000 — 105000 |
| (4) 101 | (21) 0 | (37) 56 | (61) 96 |
| (5) $\frac{13}{400}$ | (22) $\frac{233}{990}$ | (38) 543 | (62) — 1 |
| (6) 15 | (23) 400 | (39) $131\frac{1}{64}$ | (63) 360 |
| (7) 574 | (24) 27 | *(40) 2049 — 2264 | (64) 30 |
| (8) 363 | (25) $\frac{4}{3}, 1\frac{1}{3}$ | (41) 120 | (65) $\frac{31}{6}, 5\frac{1}{6}$ |
| (9) — .6, — $\frac{3}{5}$ | (26) 288 | (42) 200 | (66) 1 |
| *(10) 84646 — 93556 | (27) 4950 | (43) 12 | (67) .5, $\frac{1}{2}$ |
| (11) 1225 | (28) 76 | (44) .015625, $\frac{1}{64}$ | (68) 0 |
| (12) — $1\frac{5}{6}$ | (29) $\frac{15}{7}, 2\frac{1}{7}$ | (45) 1430 | (69) 804 |
| (13) — $\frac{4}{13}$ | *(30) 38241 — 42266 | (46) — 2 | *(70) 99072 — 109499 |
| (14) .015 | (31) 13 | (47) 1 | (71) 48 |
| (15) — 76 | (32) 4 | (48) 176 | (72) 1 |
| (16) $12.5, \frac{25}{2}, 12\frac{1}{2}$ | (33) 3 | (49) 18 | (73) 172 |
| (17) 50175 | | *(50) 25650 — 28350 | (74) $\frac{8}{35}$ |
| | | (51) 39483 | (75) — 2 |
| | | (52) — 1 | (76) 60 |
| | | (53) 108 | (77) 35 |
| | | (54) $\frac{1}{3}$ | (78) $5.25, \frac{21}{4}, 5\frac{1}{4}$ |
| | | (55) 15 | (79) 4 |
| | | (56) 133 | *(80) 21856 — 24156 |
| | | (57) 7 | |

*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) 2241 | (19) 9975 | (36) 15 | (59) $1.25, \frac{5}{4}, 1\frac{1}{4}$ |
| (2) 67.95 | *(20) $377 - 416$ | (37) 2 | *(60) $200164 - 221232$ |
| (3) $\frac{3}{11}$ | (21) $-3\frac{1}{6}$ | (38) $245\frac{1}{121}$ | (61) $.25, \frac{1}{4}$ |
| (4) 27 | (22) 1414 | (39) 0 | (62) 88 |
| (5) 765 | (23) 10 | *(40) $187 - 206$ | (63) $3.2, \frac{16}{5}, 3\frac{1}{5}$ |
| (6) 60 | (24) 8 | (41) -113 | (64) 7 |
| (7) 361 | (25) $\frac{2}{3}$ | (42) -3 | (65) 660 |
| (8) 10 | (26) 810 | (43) 1188 | (66) $3.5, \frac{7}{2}, 3\frac{1}{2}$ |
| (9) $35\frac{2}{3}$ | (27) 6 | (44) -8 | (67) 4 |
| *(10) $6893 - 7617$ | (28) 5 | (45) $.0625, \frac{1}{16}$ | (68) $7.25, \frac{29}{4}, 7\frac{1}{4}$ |
| (11) $12\frac{7}{10}$ | (29) 6600 | (46) 343 | (69) 6 |
| (12) $\frac{8}{33}$ | *(30) $4621 - 5106$ | (47) 121 | *(70) $450571 - 497999$ |
| (13) 528 | (31) 6006 | (48) 18 | (71) 49 |
| (14) 7.29 | (32) $13.5, \frac{27}{2}, 13\frac{1}{2}$ | (49) $-1.2, -\frac{6}{5}, -1\frac{1}{5}$ | (72) $\frac{2}{3}$ |
| (15) 144 | (33) -172 | *(50) $1645 - 1817$ | (73) $1.25, \frac{5}{4}, 1\frac{1}{4}$ |
| (16) 2997 | (34) 5 | (51) 0 | (74) 4 |
| (17) 14641 | (35) 81 | (52) 35 | (75) 600 |
| (18) $-\frac{22}{7}$ | | (53) 16074 | (76) $\frac{13}{15}$ |
| | | (54) 24 | (77) 5 |
| | | (55) 4 | (78) 2 |
| | | (56) 4 | (79) 288 |
| | | (57) 15 | *(80) $50806 - 56153$ |
| | | (58) 3 | |

University Interscholastic League - Number Sense Answer Key HS • District 1 • 2007

*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) 1980 | (18) 9312 | (34) — 7 | (58) 5 |
| (2) $\frac{2}{3}$ | (19) 20 | (35) 2 | (59) 9 |
| (3) $28\frac{4}{7}$ | *(20) 973 — 1074 | (36) 234 | *(60) 2,137,500 — 2,362,500 |
| (4) 30.45 | (21) $131\frac{1}{64}$ | (37) $\frac{1}{6}$ | (61) 894 |
| (5) $112\frac{1}{2}$ | (22) 3 | (38) 32 | (62) 0 |
| (6) $77\frac{7}{9}$ | (23) \$2.50 | (39) 264 | (63) 64 |
| (7) 576 | (24) 225 | *(40) 60694 — 67082 | (64) 14 |
| (8) — 2.5, — $2\frac{1}{2}$, — $\frac{5}{2}$ | (25) 2002 | (41) 27 | (65) 514 |
| (9) 976 | (26) 4 | (42) .2, $\frac{1}{5}$ | (66) $\frac{13}{24}$ |
| *(10) (— 138) — (— 126) | (27) 12 | (43) 56.25, $56\frac{1}{4}$, $\frac{225}{4}$ | (67) 900 |
| (11) 1331 | (28) 4125 | (44) 1584 | (68) $32\frac{8}{9}$ |
| (12) 18 | (29) 85 | (45) 7 | (69) 1 |
| (13) 9.61 | *(30) 569 — 628 | (46) 1331 | *(70) 62 — 68 |
| (14) 132 | (31) 640 | (47) 4 | (71) 55 |
| (15) — $7\frac{1}{14}$ | (32) 9 | (48) 7 | (72) — .5, — $\frac{1}{2}$ |
| (16) $4\frac{1}{6}$, $\frac{25}{6}$ | (33) — $\frac{7}{18}$ | (49) — 12 | (73) $\frac{28}{45}$ |
| (17) $\frac{8}{11}$ | | *(50) 1577 — 1742 | (74) — $2\frac{1}{3}$, — $\frac{7}{3}$ |
| | | (51) 2500 | (75) 858 |
| | | (52) 108332 | (76) $\frac{7}{165}$ |
| | | (53) 4 | (77) 112 |
| | | (54) 243 | (78) — 83 |
| | | (55) 220 | (79) 9 |
| | | (56) 1.2, $1\frac{1}{5}$, $\frac{6}{5}$ | *(80) 124 — 136 |
| | | (57) 1.5, $1\frac{1}{2}$, $\frac{3}{2}$ | |

University Interscholastic League - Number Sense Answer Key HS • District 2 • 2007

*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) 14049 | (18) 315 | (35) 9 | (57) $.25, \frac{1}{4}$ |
| (2) $1 \frac{23}{35}$ | (19) 18 | (36) $21 \frac{7}{15}$ | (58) -1 |
| (3) $286 \frac{5}{7}$ | *(20) $149 - 164$ | (37) $-.25, -\frac{1}{4}$ | (59) 4 |
| (4) 20.95 | (21) $-6.25, -6\frac{1}{4},$
$-\frac{25}{4}$ | (38) 5 | *(60) $54205 - 59909$ |
| (5) $\frac{13}{50}$ | (22) $351 \frac{1}{49}$ | (39) 10010 | (61) 96 |
| (6) .0325 | (23) 121 | *(40) $1619 - 1788$ | (62) 4884 |
| (7) $50 \frac{2}{3}$ | (24) $.5, \frac{1}{2}$ | (41) 6175 | (63) 285 |
| (8) 289 | (25) 361 | (42) -718 | (64) 6 |
| (9) 5 | (26) 540 | (43) 20 | (65) $\frac{52}{125}$ |
| *(10) $(-324) - (-293)$ | (27) 56 | (44) $43.75, 43\frac{3}{4}, \frac{175}{4}$ | (66) 4 |
| (11) 14641 | (28) 19800 | (45) 5625 | (67) $\frac{1}{6}$ |
| (12) $15 \frac{3}{4}$ | (29) 600 | (46) 144 | (68) $3.5, 3\frac{1}{2}, \frac{7}{2}$ |
| (13) 784 | *(30) $60762 - 67158$ | (47) 2 | (69) 608 |
| (14) 11342 | (31) 3 | (48) $1.5, 1\frac{1}{2}, \frac{3}{2}$ | *(70) $1232 - 1360$ |
| (15) 999 | (32) 0 | (49) 12 | (71) $.5, \frac{1}{2}$ |
| (16) $-.375, -\frac{3}{8}$ | (33) 55 | *(50) $22624 - 25004$ | (72) 0 |
| (17) 84 | (34) 202 | (51) 840 | (73) 19 |
| | | (52) 17365 | (74) 6 |
| | | (53) 6 | (75) 256 |
| | | (54) 6 | (76) -1 |
| | | (55) 0 | (77) 4 |
| | | (56) 10 | (78) -216 |
| | | | (79) 176 |
| | | | *(80) $1160 - 1282$ |

*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) 4950 | (18) 60 | (35) 4 | (58) 4 |
| (2) 792 | (19) 12 | (36) 11011 | (59) 53 |
| (3) 270.72 | *(20) 171 — 188 | (37) 192 | *(60) 150293 — 166113 |
| (4) $2\frac{2}{3}$ | (21) 2 | (38) 32 | (61) 2500 |
| (5) $\frac{13}{500}$ | (22) 3210 | (39) — 900 | (62) $4\frac{1}{6}, \frac{25}{6}$ |
| (6) 6.25, $6\frac{1}{4}, \frac{25}{4}$ | (23) 1.05 | *(40) 86184 — 95256 | (63) 6 |
| (7) 529 | (24) $\frac{7}{16}$ | (41) — 21 | (64) 3 |
| (8) $-1\frac{2}{3}, -\frac{5}{3}$ | (25) 37.5, $37\frac{1}{2}, \frac{75}{2}$ | (42) — .054, $-\frac{27}{500}$ | (65) $\frac{27}{784}$ |
| (9) $\frac{5}{6}$ | (26) 13 | (43) 20 | (66) 499849 |
| *(10) (— 1770) —
(— 1602) | (27) 1210 | (44) $2.5, 2\frac{1}{2}, \frac{5}{2}$ | (67) 1 |
| (11) 1210 | (28) 54000 | (45) 2002 | (68) 0 |
| (12) $-8\frac{1}{12}$ | (29) 4 | (46) 240 | (69) 893 |
| (13) $-\frac{16}{17}$ | *(30) 4304 — 4756 | (47) 1331 | *(70) 232072 — 256499 |
| (14) 9.61 | (31) $2.5, 2\frac{1}{2}, \frac{5}{2}$ | (48) $1\frac{4}{195}$ | (71) $\frac{4}{21}$ |
| (15) 462 | (32) $-4, 3$ | (49) $-.75, -\frac{3}{4}$ | (72) $-.5, -\frac{1}{2}$ |
| (16) $-\frac{6}{11}$ | (33) $101\frac{1}{49}$ | *(50) 3911 — 4321 | (73) $1.5, 1\frac{1}{2}, \frac{3}{2}$ |
| (17) 1664 | (34) 324 | (51) 3 | (74) — 3 |
| | | (52) 24976 | (75) $\frac{35}{36}$ |
| | | (53) $112.5, 112\frac{1}{2}, \frac{225}{2}$ | (76) 2310 |
| | | (54) 22 | (77) 176 |
| | | (55) $1.5, 1\frac{1}{2}, \frac{3}{2}$ | (78) — 3 |
| | | (56) $.25, \frac{1}{4}$ | (79) 80 |
| | | (57) 9 | *(80) 2399 — 2651 |

University Interscholastic League - Number Sense Answer Key HS • State • 2007

*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) 8027 | (18) 726 | (34) 686 | (58) 8 |
| (2) $1\frac{7}{15}, \frac{22}{15}$ | (19) 285 | (35) 333 | (59) 32 |
| (3) – 500.5 | *(20) 2477 – 2737 | (36) 160 | *(60) 3407 – 3765 |
| (4) $3\frac{1}{2}$ | (21) 2 | (37) 9009 | (61) 672 |
| (5) 362.5 | (22) 2300 | (38) 0 | (62) 36663 |
| (6) 9 | (23) $53\frac{1}{25}$ | (39) 1155 | (63) $-1\frac{1}{7}, -\frac{8}{7}$ |
| (7) 1156 | (24) 5 | *(40) 157586 – 174174 | (64) 0 |
| (8) 1.28, $1\frac{7}{25}, \frac{32}{25}$ | (25) 4 | (41) 35 | (65) 534 |
| (9) 1458 | (26) 640 | (42) 4 | (66) $-.25, -\frac{1}{4}$ |
| *(10) 2418 – 2672 | (27) $-1\frac{1}{3}, -\frac{4}{3}$ | (43) 15 | (67) $\frac{19}{1342}$ |
| (11) 1331 | (28) 4410 | (44) 1000 | (68) – 4 |
| (12) $-6\frac{1}{12}$ | (29) 9 | (45) 2160 | (69) 602 |
| (13) $-\frac{5}{7}$ | *(30) 1031 – 1139 | (46) 13.31 | *(70) 114 – 126 |
| (14) 11016 | (31) 300 | (47) $2.5, 2\frac{1}{2}, \frac{5}{2}$ | (71) 39 |
| (15) 840 | (32) 0 | (48) 5225 | (72) $.5, \frac{1}{2}$ |
| (16) $.625, \frac{5}{8}$ | (33) 2 | (49) 223 | (73) 18 |
| (17) $\frac{9}{11}$ | | *(50) 2463 – 2721 | (74) 256 |
| | | (51) – 1 | (75) $\frac{124}{125}$ |
| | | (52) 13794 | (76) 35 |
| | | (53) 7 | (77) $\frac{1}{24}$ |
| | | (54) $-1.5, -1\frac{1}{2}, -\frac{3}{2}$ | (78) 80 |
| | | (55) 225 | (79) 12 |
| | | (56) 142 | *(80) 119 – 131 |
| | | (57) – 7200 | |