The University Interscholastic League
Number Sense Test • HS SAC • 2014

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.

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STOP -- WAIT FOR SIGNAL!

(1) $913 + 2014 =$ _____

(2) $11.15 - 2.014 =$ _____ **(decimal)**

(3) $80 \times 25 =$ _____

(4) $2015 \div 5 =$ _____

(5) $37.5\% =$ _____ **(proper fraction)**

(6) $11 \times (120 - 15) + 27 \div 9 =$ _____

(7) $3\frac{4}{5} - 2\frac{3}{4} =$ _____ **(mixed number)**

(8) $17^2 =$ _____

(9) 9272014 ÷ 11 has a remainder of _____

***(10)** $913 + 927 + 111 + 1115 =$ _____

(11) 5.76 is 24% of _____

(12) DCCLXXIV = _____ **(Arabic Numeral)**

(13) $27 \times 13 =$ _____

(14) $9\frac{1}{3} + 11\frac{1}{5} =$ _____ **(mixed number)**

(15) $1 + 2 + 3 + 4 + \ldots + 39 =$ _____

(16) 1 gallon + 1 quart + 1 pint = _____ fluid ounces

(17) $9 \times 13 + 9 \times 27 =$ _____

(18) If 7 YIPS cost $6.37 then 21 YIPS cost $_____

(19) The multiplicative inverse of 1.8333... is _____

***(20)** $1115111 \div 2015 =$ _____

(21) $3^2 + 9^2 =$ _____

(22) $(12 \times 15 + 18) \div 8$ has a remainder of _____

(23) Convert 53 base 10 to base 7. _____$_7$

(24) 0.0625 ÷ 0.08333... = _____ **(decimal)**

(25) If 6 ⋈ s cost $5.50 then 9 ⋈ s cost $ _____

(26) $2\frac{4}{5} \times 3\frac{1}{8} =$ _____ **(mixed number)**

(27) The number of positive integral divisors of 60 is __

(28) If $f(x) = x^3 + 3x^2 + 3x + 1$ then f(9) is _____

(29) Set A has 5 elements and set B has 8 elements. If $A \cap B$ has 3 elements, then $A \cup B$ has ___ elements

***(30)** $\sqrt{913} \times 927 =$ _____

(31) $2014 \times 15 =$ _____

(32) $5! - 4! + 3! - 2! =$ _____

(33) How many subsets containing only 3 elements does the set {n,u,m,b,e,r} have? _____

(34) $1115_6 + 2014_6$ = _____ 6

(35) $|2x - 3| = 5$. Find x, where $x \leq 0$. _____

(36) If x = 7 and y = 11 then $x^2 + 2xy + y^2$ = _____

(37) Find k if $17^2 - 13^2 = 4k$. k = _____

(38) $3\frac{1}{8} \div 3\frac{3}{4}$ = _____

(39) If $x + (x + 4) + (x + 8) + (x + 12) + (x + 16) = 50$ then $(x + 8)$ = _____

*(40) $1115 \times 2014 \div 111$ = _____

(41) 9% of $133\frac{1}{3}$ = _____

(42) The sum of the roots of $x^2 + 6x + 9 = 0$ is _____

(43) $54 \times 0.555...$ = _____

(44) If $A^k \div A^4 \times A^{-6} = A^8$ and $A > 1$, then k = ____

(45) The point (4, 2) is reflected across the line y = 3 to the point (h, k). Find h + k. _____

(46) $1 + 5 + 6 + 11 + 17 + 28 + 45 + 73$ = _____

(47) If x + y = 2 and x − y = 5 then y = _____

(48) $(1 + 2i)(3 - 4i) = a + bi$. Find a + b. _____

(49) A right triangle has a base of 12" and a hypotenuse of 13". What is the length of the altitude? _____ in

*(50) $\sqrt{13270115}$ = _____

(51) ${}_5C_3$ = _____

(52) If $\log_4(x) = 2.5$ then x = _____

(53) The coefficient of the xy term when $(2x + 3y)^2$ is expanded is _____

(54) $9 + 6 + 4 + 2.666... + 1.777... + ...$ = _____

(55) $232_8 \div 7_8$ = _____ 8

(56) The first 4 digits of the decimal of $\frac{23}{99}$ is 0._____

(57) The smaller root of $x^2 - 5x + 6 = 0$ is _____

(58) 302×203 = _____

(59) The probability of randomly selecting a Fibonacci number from the set of odd digits is _____%

*(60) $11^3 \div 22^2 \times 33$ = _____

(61) $\sin(30°) + \cos(60°) + \tan(45°)$ = _____

(62) 112×108 = _____

(63) Change 0.5333... 6 to a base 6 fraction. _____ 6

(64) The frequency of $y = 1 - 2\sin(3\pi(4\theta - 5))$ is ____

(65) How many positive integers less than 28 are relatively prime to 28? _____

(66) $f(x) = x^2 - 3$ and $g(x) = 1 - 3x$. f(g(2)) = _____

(67) If $\ln(40) = \ln(5) + k\ln(2)$, then k = _____

(68) The determinant of $\begin{bmatrix} -1 & -2 \\ 1 & 3 \end{bmatrix}$ is _____

(69) If $f(x) = \frac{3 - 2x}{4}$, then $f^{-1}(1)$ = _____

*(70) The surface area of a sphere with a diameter of 6 inches is _____ sq. inches

(71) $F(x) = x^3 + 3x^2 + 3x + 1$. Find $F'(1)$. _____

(72) The base of a triangle is 27". If the altitude is increased from 13" to 17", the corresponding increase in the area is _____ sq. in.

(73) The harmonic mean of the roots of $x^3 - 7x^2 + 14x - 8 = 0$ is _____

(74) Let $\frac{6!}{4!} = \frac{x!}{(x-1)!}$. Find x. _____

(75) $\int_{-1}^{1} (x + 1)\,dx$ = _____

(76) The Greatest Integer Function is written as $f(x) = [x]$. Find $\left[\sqrt{2} + \sqrt{3} + \sqrt{5}\right]$. _____

(77) The first *perfect* number is _____

(78) GCD(k, 15) = 3. LCM(k, 15) = 135. k = _____

(79) $11_2 + 33_4$ = _____ 8

*(80) $\sqrt[3]{9132014}$ = _____

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Number Sense Test • HS A • 2015

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(1) $1927 + 2015 =$ _____

(2) $109 - 207 - 2015 =$ _____

(3) $214 \times 15 =$ _____

(4) $2015 \div 9 =$ _____ **(mixed number)**

(5) $14^2 =$ _____

(6) $0.1666... =$ _____ **(proper fraction)**

(7) $20\frac{1}{9} + 15\frac{2}{7} =$ _____ **(mixed number)**

(8) 64 is _____% of 1600

(9) $10 \times (9 - 20) \div (7 + 15) =$ _____

***(10)** $20720 + 10915 =$ _____

(11) $83.333...\% =$ _____ **(proper fraction)**

(12) $9 \times 20 + 9 \times 15 =$ _____

(13) $235 \times 14 =$ _____

(14) $2\frac{1}{6} - 4\frac{3}{5} =$ _____ **(mixed number)**

(15) $1 + 2 + 3 + 4 + ... + 28 =$ _____

(16) MDXXIX = _____ **(Arabic Numeral)**

(17) $2197 \div 13 =$ _____

(18) 1 yard + 2 feet + 3 inches = _____ inches

(19) $109207 \div 11$ has a remainder of _____

***(20)** $5102702 \div 109 =$ _____

(21) $1 - |3 - 6| + |10 - 15| + 21 =$ _____

(22) If 4 CDs cost $25.00 then 10 CDs cost $_____

(23) $1\frac{3}{4} \times 2\frac{2}{3} =$ _____ **(mixed number)**

(24) $14^2 + 42^2 =$ _____

(25) If $1.111... \times k = 1$, then $k =$ _____

(26) If $x - 3 = 5$ then $3x + 5 =$ _____

(27) $(19 \times 27 + 15) \div 6$ has a remainder of _____

(28) If $x + (x + 3) + (x + 6) + (x + 9) + (x + 12) = 40$ then $(x + 6) =$ _____

(29) $432_5 =$ _____ 10

***(30)** $\sqrt{109} \times \sqrt{207} =$ _____

(31) $5\frac{1}{4} \div 2\frac{1}{3} =$ _____ **(mixed number)**

(32) Let M = {m,i,x,e,d} and N = {n,u,m,b,e,r}. How many unique elements are in $M \cap N$? _____

(33) 78 is divisible by how many natural numbers?____

(34) Round $\sqrt{2}$ to the thousandth place. _____

(35) The length of a rectangle is 1 more than the width. Find the perimeter if the area is 20 cm^2. _____ cm.

(36) How many subsets containing only 2 elements does the set {p,o,i,n,t} have? _____

(37) If x = 5 and y = 9 then $x^2 + 2xy + y^2$ = _____

(38) If $4^x = 64$ then x^4 = _____

(39) How long does it take to drive 210 miles at a rate of 60 mph? _____ hours

*(40) $98 \times \frac{1}{4} \times 728 \times \frac{1}{7}$ = _____

(41) $\frac{11}{25} - \frac{43}{101}$ = _____

(42) $2 + 7 + 9 + 16 + 25 + 41 + 66 + 107$ = _____

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

(44) $13 \times \frac{14}{15}$ = _____

(45) P,Q, and R are the roots of $2x^3 - 9x^2 - 2x + 8 = 0$. Find PQR + P + Q + R. _____

(46) Find k if $21^2 - 29^2 = -16k$. k = _____

(47) The arithmetic mean of 18, 31, and 53 is _____

(48) 12% of $266\frac{2}{3}$ = _____

(49) $344_5 + 43_5$ = _____ 5

*(50) The volume of a right cylinder with a radius of 6" and a height of 9" is _____ cu. in

(51) $(4 - 13i)(4 + 13i) = (a + bi)$. Find b. _____

(52) Let $\frac{7!}{6!} = \frac{x!}{(x-1)!}$. Find x. _____

(53) 126×261 = _____

(54) $145_6 \div 5_6$ = _____ 6

(55) The legs of a right △ are 5" and 12". The length of the altitude to the hypotenuse is _____ inches

(56) If $2\log_3(3x) = 4$ then x = _____

(57) The point (— 1, 5) is reflected across the line y = 2 to the point (h, k). Find k. _____

(58) The probability of drawing a 2, 3, or 4 from a standard 52 card deck is _____

(59) The first 4 digits of the decimal of $\frac{253}{999}$ is 0._____

*(60) $8^4 \div 4^4 \times 2^4$ = _____

(61) Change 0.4777..._8 to a base 8 fraction. _____ 8

(62) The greatest integer function $f(x) = [x + 2]$ has a value of _____ for $f(\sqrt{2})$

(63) $2\sin 15° \cos 15°$ = _____

(64) If $\ln(60) = \ln(15) + 2\ln(k)$, then k = _____

(65) The simplified coefficient of the xy^2 term in the expansion of $(2x + y)^3$ is _____

(66) 27×37 = _____

(67) How many positive integers less than 32 are relatively prime to 32? _____

(68) The larger root of $3x^2 + 8x + 5 = 0$ is _____

(69) The seventh term of 3, 8, 11, 19, 30, ... is _____

*(70) 1092015 ÷ 207 = _____

(71) The perimeter of a square is increased from 17.5" to 18.5". Find the corresponding increase in the area of the square. _____ sq. in.

(72) Find k if $\det\begin{bmatrix} k & -5 \\ 4 & -6 \end{bmatrix} = 3$. k = _____

(73) 2 bushels + 2 pecks = _____ quarts

(74) $\lim_{x \to \infty} \frac{2x}{4x - 1}$ = _____

(75) The polar coordinates of the rectangular coordinate $(1, \sqrt{3})$ are (r , θ). θ = _____°

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

(77) The graph of $y = \frac{x + 4}{x^2 + 16}$ has _____ asymptote(s)

(78) $\int_{-1}^{2} (x)\, dx$ = _____

(79) $\frac{1}{80} + \frac{1}{48} + \frac{1}{24} + \frac{1}{8}$ = _____

*(80) $55\frac{5}{9}$% of 555 ÷ 0.55 = _____

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Number Sense Test • HS B • 2015

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(1) $21315 - 31415 =$ _____

(2) $2015 \div 3 =$ _____ **(mixed number)**

(3) $31.4 + 201.5 =$ _____ **(decimal)**

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

(5) $\frac{11}{400} =$ _____ **% (decimal)**

(6) $0.3125 =$ _____ **(proper fraction)**

(7) $68 \times 75 =$ _____

(8) The largest prime factor of 111 is _____

(9) $15^2 =$ _____

***(10)** $21320 + 1531 + 420 + 15 =$ _____

(11) The GCD of 76 and 95 is _____

(12) 3 gallons — 2quarts — 1 pint = _____ pints

(13) $2 + 6 + 10 + 14 + ... + 38 + 42 =$ _____

(14) $2\frac{1}{3} - 3\frac{1}{4} =$ _____

(15) MMXCV = _____ (Arabic Numeral)

(16) $15 \times 112 + 113 \times 15 =$ _____

(17) Which is smaller, $-\frac{4}{9}$ or $-.49$? _____

(18) $31 - 4 \div 20 \times 15 + 5 \times 2 - 13 =$ _____

(19) Which of the following is divisible by 3: 213, 314, or 2015? _____

***(20)** $314 \times 213 \times 15 =$ _____

(21) $3\frac{1}{4} + 20\frac{1}{5} =$ _____

(22) 337.5 is 15% of _____

(23) If $x + (x + 4) + (x + 8) + (x + 12) + (x + 16) + (x + 20) = 72$, then $(x + 10) =$ _____

(24) Change 84 base 10 to base 5. _____ 5

(25) If $21 - 3x = 15$ then $3x - 14 =$ _____

(26) $\frac{22}{25} - \frac{45}{49} =$ _____

(27) .1505050... = _____ **(proper fraction)**

(28) If $x = 15$ and $y = 16$ then $x^2 + 2xy + y^2 =$ _____

(29) $54^2 + 18^2 =$ _____

***(30)** $\sqrt{192} \times \sqrt[3]{4100} =$ _____

(31) 88 has n positive integral divisors. n = _____

(32) $(312 + 413 - 15) \div 20$ has a remainder of _____

(33) Find the area of a rhombus with diagonals of $11\sqrt{2}$ dm and $22\sqrt{2}$ dm. _____ dm^2

(34) $88 \times 0.090909... =$ _____

(35) If 7 Cs cost \$21.14 then 10 Cs cost \$ _____

(36) $(4)^{-2} + (2)^{-1} + (2)^{0}$ = _____

(37) How many 3 element subsets and 2 element subsets does the set {e,i,g,h,t} have? _____

(38) $15 \times \frac{17}{19}$ = _____(mixed number)

(39) The product of the primes less than 10 is _____

*(40) $28 \times 30 \times 32$ = _____

(41) If $A^2 \div A^4 \times A^k = A^8$, then k = _____

(42) $(1 - 4i)^2 = a + bi$. Find a. _____

(43) Round $(\sqrt{3})(\sqrt{2})$ to the tenths place. _____

(44) $7 + 11 + 18 + 29 + 47 + 76 + 123 + 199$ = _____

(45) The point (— 3, — 4) is reflected across the line y = — 1 to the point (h, k). Find h + k. _____

(46) The product of the roots of $3x^2 + 4x = 5$ is _____

(47) If x + y = 2 and x — y = 5 then y = _____

(48) 6% of $833\frac{1}{3}$ = _____

(49) The coefficient of the xy^2 term when $(5x + 4y)^3$ is expanded is _____

*(50) The surface area of a sphere with a diameter of 10 inches is = _____ sq. inches

(51) The hypotenuse of a right triangle is $4\sqrt{5}$ and one leg is 4. Find the other leg. _____

(52) $2\log_4(8)$ = _____

(53) ${}_6C_2$ = _____

(54) Let $\frac{8!}{6!} = \frac{(x-1)!}{(x-2)!}$. Find x. _____

(55) $233_5 \div 4_5$ = _____ 5

(56) The first 4 digits of the decimal of $\frac{29}{90}$ is 0._____

(57) How much time has passed from 2:13 a.m. to 3:14 p.m. the same day? _____ minutes

(58) The odds of randomly selecting a prime number from $\{x \mid 0 < x \leq 15\}$ is _____

(59) 314×213 = _____

*(60) $21^3 \times 31^4 \div 15^6$ = _____

(61) If csc θ = 1.25 then sin θ = _____

(62) Change $0.2131313..._4$ to a base 4 fraction. _____4

(63) f(x) = 2x — 13 and g(x) = 3x + 14. g(f(5)) = _____

(64) How many positive integers less than or equal to 16 are relatively prime to 16? _____

(65) If $f(x) = \frac{3x-2}{4}$, then $f^{-1}(-1)$ = _____

(66) If ln(9) = kln(3) — ln(9), then k = _____

(67) The first two digits of the decimal of $\frac{41}{55_6}$ is 0.___ 6

(68) If k ÷ 101 = 323, then k = _____

(69) M varies inversely with 3N and M = 7 when N = 1. If N = 5 then M = _____

*(70) 142857 × 36 = _____

(71) $\sqrt{5929}$ = _____

(72) The greatest value of k such that ${}_{10}C_k = 45$ is _____

(73) The perimeter of a square is increased from 18" to 26". Find the corresponding increase in the area is _____ sq. in.

(74) $f(x) = \frac{x^2 + 3x + 2}{x - 2}$ has how many asymptotes? ____

(75) The sum of the first two *perfect* numbers is _____

(76) If $f(x) = 2x^3 + x - 5$, then $f''(-\frac{1}{2})$ = _____

(77) $\int_1^2 (x^{-2})\ dx$ = _____

(78) Write using numbers:
twenty and three-eighths billion. _____

(79) $15^3 - 11^3$ = _____

*(80) 314 rods is equivalent to _____ feet

2014-15 TMSCA High School Number Sense Test 6

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(1) $1206 + 2014 =$ _____

(2) $2014 - 1206 =$ _____

(3) $2014 \div 6 =$ _____ **(mixed number)**

(4) $44 \times 75 =$ _____

(5) $\frac{2}{5}\% =$ _____ **(decimal)**

(6) $15^2 =$ _____

(7) $12062014 \div 11$ **has a remainder of** _____

(8) $20 \times (1 - 4) + 12 \div 6 =$ _____

(9) $2\frac{1}{4} + 6\frac{1}{2} =$ _____ **(mixed number)**

***(10)** $6021 + 4102 - 2015 =$ _____

(11) $20\frac{1}{4} - 12\frac{1}{6} =$ _____ **(mixed number)**

(12) 44 is what % of 80? _____%

(13) $16\frac{2}{3}\%$ **of a yard is** _____ **inches**

(14) MCXI = _____ **(Arabic Number)**

(15) $15^3 =$ _____

(16) The average of 38, 64 and 92 is _____

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

(18) $214 \times 16 =$ _____

(19) The LCM of 76 and 95 is _____

***(20)** $754214 \div 214 =$ _____

(21) $\frac{3}{40} =$ _____ **% (decimal)**

(22) $(25 \times 32 + 51) \div 6$ **has a remainder of** _____

(23) Convert 111 base 8 to base 10. _____

(24) $0.666... \times 0.272727... =$ _____

(25) $\sqrt{63} + \sqrt{28} = \sqrt{x}$ **. Find x.** _____

(26) $0.3888... =$ _____ **(proper fraction)**

(27) $8^2 + 24^2 =$ _____

(28) Find k if $21^2 - 15^2 = 6k$. **k =** _____

(29) How many subsets containing only 4 elements does the set {v,o,l,u,m,e} have? _____

***(30)** $\sqrt{730} \times 329 =$ _____

(31) If $x + (x + 3) + (x + 6) + (x + 9) + (x + 12) = 105$ **then** $(x + 6) =$ _____

(32) $6! \div 4! + 5! \div 3! =$ _____

(33) $6\frac{1}{2} \div 2\frac{1}{4} =$ _____ **(mixed number)**

(34) $2014_8 - 1206_8 =$ _____ **8**

(35) If 20 Ω**s cost \$4.80 then 15** Ω**s cost \$** _____

(36) The product of the roots of $3x^2 + 4x - 5 = 0$ is _____

(37) $63^2 + 24^2$ = _____

(38) $3\frac{4}{7} \times 1\frac{9}{10}$ = _____ (mixed number)

(39) If x = 11 and y = 7 then $2x^2 - 4xy + y^2$ = _____

*(40) $4102 \times 6012 \div 612$ = _____

(41) The leg opposite the 45° angle in a right triangle is $\sqrt{8}$. The hypotenuse is _____

(42) $18 \times \frac{19}{20}$ = _____

(43) $3 \div 0.0625$ = _____

(44) Find the slope of a line containing the points $(-4, 3)$ and $(5, 5)$. _____

(45) $266\frac{2}{3}\%$ of 27 = _____

(46) If $xy = 5$ and $x - y = 4$ then $x^3 - y^3$ = _____

(47) $20^2 \div 10^2 \times 5^2$ = _____

(48) $3 + 8 + 11 + 19 + 30 + 49 + 79 + 128$ = _____

(49) If $12^{(x)} = 78$ then $12^{(x-1)}$ = _____

*(50) $\sqrt{12062014}$ = _____

(51) If $\log_8(6x - 4) = 2$ then x = _____

(52) $234_8 \div 6_8$ = _____ $_8$

(53) The point $(-3, -2)$ is reflected across the line $x = -1$ to the point (h, k). Find h. _____

(54) ${}_6C_4 \div {}_6C_2$ = _____

(55) The sum of the coefficients in the binomial expansion of $(8x + 4y)^3$ is _____

(56) The conjugate of $3 + 4i$ is $a + bi$. Find $a + b$. ____

(57) 126×214 = _____

(58) The larger root of $6x^2 - 7x - 5 = 0$ is _____

(59) Let $\frac{8!}{7!} = \frac{x!}{(x+1)!}$. Find x. _____

*(60) $22 \times 44 \times 88$ = _____

(61) 76^2 = _____

(62) Change $0.4777..._8$ to a base 10 fraction. _____

(63) How many 3-element subsets does a 5-element set contains? _____

(64) $24^2 + 26^2$ = _____

(65) The determinant of $\begin{bmatrix} 1 & 3 \\ k & 6 \end{bmatrix} = 10$. k = _____

(66) The volume of a right circular cone that is 18 cm high and has a diameter of 12 cm is _____π cm^3

(67) How many positive integers less than 44 are relatively prime to 44 ? _____

(68) $(\sin 15° \cos 45° + \sin 45° \cos 15°)^2$ = _____

(69) If $\ln(8) = \ln(4) + k\ln(4)$, then k = _____

*(70) $(e + \pi)^3$ = _____

(71) $f(x) = 2x^2 + 3x - 2$. Find $f(f(-1))$. _____

(72) The Greatest Integer Function is written as $f(x) = [x]$. Find $\left[\sqrt{7} - \sqrt{3}\right]$. _____

(73) The area of a square is decreased from 625 sq. in. to 576 sq. in. Find the corresponding decrease in the perimeter. _____ in.

(74) Find the slope of the line tangent to $y = 2x^2 + 3x - 2$ at $(-1, -3)$. _____

(75) $\int_1^4 (x^{-2})\,dx$ = _____

(76) $0.313131..._5$ = _____ $_5$ (proper fraction)

(77) $\frac{1}{3} + \frac{1}{6} + \frac{1}{10} + \frac{1}{15} + \frac{1}{21}$ = _____

(78) The first four digits of the decimal for $\frac{16}{90}$ is 0.____

(79) $\sum_{k=1}^{3} (-k)^2$ = _____

*(80) $630 \div 0.375 \times \frac{5}{8}$ = _____

2014-15 TMSCA High School Number Sense Test 12

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.

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STOP -- WAIT FOR SIGNAL!

(1) $30815 + 31515 =$ _____

(2) $5183 - 2015 =$ _____

(3) $342 \times 16 =$ _____

(4) $3815 \div 8 =$ _____ (decimal)

(5) $\frac{9}{250} =$ _____ % (decimal)

(6) $34^2 =$ _____

(7) $8 \div 5 + 11 \times 2 - 14 =$ _____

(8) $72 \times 68 - 22 \times 68 =$ _____

(9) The LCM of 84 and 63 is _____

***(10)** $308 + 2015 + 5102 + 513 =$ _____

(11) $308 \times 15 =$ _____

(12) 25% of $(2.5 + \frac{2}{5}) =$ _____

(13) Seven-eighths of 3 pounds is _____ ounces

(14) $83 \times 38 =$ _____

(15) $84 + 64 - 44 - 61 + 41 + 21 =$ _____

(16) The number of positive integral divisors of 140 is _____

(17) 40 is what % of 50? _____%

(18) $31 \times \frac{31}{35} =$ _____ (mixed number)

(19) $1515 \div 6$ has a remainder of _____

***(20)** $815 \times 1515 =$ _____

(21) If x is to 25 as 7 is to 10 then x = _____

(22) $(11 + 23 \times 9 - 17) \div 4$ has a remainder of _____

(23) $14^3 =$ _____

(24) $2\frac{3}{5} + 5\frac{2}{3} =$ _____ (mixed number)

(25) Find the simple interest on $1500 at 1.5% for 15 months. $ _____

(26) 315 base 6 equals _____ base 10

(27) $11^2 + 33^2 =$ _____

(28) If 24 Cs cost $3.20 then 18 Cs cost $ _____

(29) $3081515 \div 9$ has a remainder of _____

***(30)** $5102803 \times 15 =$ _____

(31) The product of a number x and 6 has the save value as the sum of x and 9. Find x. _____

(32) If $x + (x + 3) + (x + 6) + (x + 9) + \ldots + (x + 24) = 144$, then $(x + 12) =$ _____

(33) $\sqrt{196 \times 256} =$ _____

(34) If x = 9 and y = 3 then $x^2 - 6xy + 9y^2 =$ _____

(35) 40% of 60 less 80 is _____

(36) Round $\sqrt{8} - \sqrt{5}$ to the tenths place. _____

(37) 24% of $233\frac{1}{3}$ = _____

(38) $39^2 - 38^2$ = _____

(39) $11 \times \frac{13}{15}$ = _____

*(40) $43 \times 54 \times 65$ = _____

(41) How many positive integers less than 24 are relatively prime to 24? _____

(42) The sum of the roots of $x^2 - 6x + 9 = 0$ is _____

(43) $72 \times 0.41666...$ = _____

(44) If $A^3 \div A^k \times A^{-5} = A^6$ and $A > 1$, then k = ____

(45) $12 + 9 + 6\frac{3}{4} + 5\frac{1}{16} + ...$ = _____

(46) $12^3 \div 6^3 \times 3^3$ = _____

(47) $2 + 5 + 7 + 12 + 19 + ... + 81$ = _____

(48) $(3 - 7i)(5 - 2i) = a + bi$. Find a — b. _____

(49) $453_7 \div 6_7$ = _____ 7

*(50) $\sqrt{308152015}$ = _____

(51) How many subsets containing only 4 elements does the set {d,e,c,i,m,a,l,s} have? _____

(52) If $\log_x(27) = 1.5$ then x = _____

(53) 415×312 = _____

(54) The point (— 3, — 1) is reflected across the line x = 4 to the point (h, k). Find h + k. _____

(55) The sum of the first two *perfect* numbers is _____

(56) The coefficient of the xy^2 term when $(x + 2y)^3$ is expanded is _____

(57) The smaller root of $3x^2 + 7x - 6 = 0$ is _____

(58) The first 4 digits of the decimal of $\frac{23}{90}$ is 0._____

(59) (52) Let $\frac{7!}{5!} = \frac{(x-1)!}{(x-2)!}$. Find x. _____

*(60) $27^3 \div 9^2 \times 3^4$ = _____

(61) $52^2 - 56^2 + 60^2 - 64^2$ = _____

(62) If ln(64) = ln(4) + kln(2), then k = _____

(63) $\frac{5}{24} + \frac{5}{48} + \frac{5}{80} + \frac{5}{120}$ = _____

(64) How many hours are there from 6:30 a.m. on March 2 to 4:15 p.m. on March 3? _____

(65) (sin 315°)(cos 315°)(tan 315°) = _____

(66) Find k, $0 \le k \le 8$, if $3k + 5 \cong 14 \pmod 9$. _____

(67) Convert $0.1666...{}_8$ to a base 8 fraction. _____ 8

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

(69) The slope of the line 4x — 5y = 6 is _____

*(70) 3125 ÷ 5.625 = _____

(71) The perimeter of a square is increased from 18" to 34". Find the corresponding increase in the area of the square. _____ sq. in.

(72) The frequency of $y = 1 + 3\sin(4\pi x - 2\pi)$ is _____

(73) If $f(x) = x^3 + 2x^2 - 3x + 4$, then $f''(5)$ = _____

(74) $777 \times \frac{21}{37}$ = _____

(75) 0.1242424... = _____ (proper fraction)

(76) Write the sum using numbers: three and one-fifth billion plus twenty million. _____

(77) $\int_0^2 (1 - 2x)\, dx$ = _____

(78) $2\cos^2(150°) - 1$ = _____

(79) $\prod_{k=1}^{3} k^2 + k$ = _____

*(80) The surface area of a sphere with a diameter of 24 inches is _____ sq. inches

2014-15 TMSCA High School State Meet

Final _____ _____

Contestant's Number _____ 2nd _____ _____

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(1) $1421 + 594 =$ _____

(2) $2015 - 1693 =$ _____

(3) $321 \times 8 =$ _____

(4) $2015 \div 4 =$ _____ **(decimal)**

(5) $33^2 =$ _____

(6) $3212015 \div 9$ **has a remainder of** _____

(7) $3\frac{1}{2} + 20\frac{1}{5} =$ _____ **(mixed number)**

(8) $3 + 2 \times 1 - 20 \div 15 =$ _____

(9) $3\frac{2}{5}\% =$ _____**(proper fraction)**

***(10)** $5102 - 2015 + 321 - 123 =$ _____

(11) $7\frac{2}{9} - 5\frac{1}{6} =$ _____ **(mixed number)**

(12) $|3 - 2| - 1 + |2 - 0| + |1 - 5| =$ _____

(13) **64 is** _____**% of 96**

(14) **Three-fourths of 2 quarts is** _____ **fluid ounces**

(15) $9 + 14 + 19 + 24 + ... + 44 + 49 =$ _____

(16) **The GCF of 68, 85, and 102 is** _____

(17) $\frac{15}{22} \times 15 =$ _____ **(mixed number)**

(18) $CCCXIV + VII =$ _____ **(Arabic Number)**

(19) $253 \times 18 =$ _____

***(20)** $494 \times 408 =$ _____

(21) $6\frac{2}{3} \times 3\frac{1}{3} =$ _____ **(mixed number)**

(22) **The number of positive integral divisors of 160 is** _____

(23) $13^2 + 39^2 =$ _____

(24) **If** $5^2 + 3^3 - 2^5 = 4k$, **then** $k^2 =$ _____

(25) $3210_4 =$ _____ **10**

(26) **If 6 ties cost $28.50 then 8 ties cost $** _____

(27) **Find the ratio of the perimeter of an 8" x 10" picture frame to its area.** _____

(28) **Which of the following is an odious number, 63, 31, or 15?** _____

(29) $3212015 \div 11$ **has a remainder of** _____

***(30)** $26 \times 64 + 32 \times 52 =$ _____

(31) $321_6 + 20_6 - 15_6 =$ _____ **6**

(32) $3 + 2 + 5 + 7 + 12 + ... + 81 + 131 =$ _____

(33) **How many subsets of the set {p,o,i,n,t} are 2-element or 3-element subsets?** _____

(34) **Given** $32120 \div 15 = 2141\frac{1}{3}$. **Find** $32120 \div 5$. _____

(35) $4\frac{3}{8} \div 2\frac{1}{3} =$ _____ (mixed number)

(36) If x = 18 and y = 11 then $4x^2 - 12xy + 9y^2 =$ _____

(37) 321 base 10 is equivalent to _____ base 4

(38) Truncate $\sqrt{2} + \sqrt{8}$ to a natural number. ____

(39) If $x + (x + 5) + (x + 10) + (x + 15) + \ldots + (x + 30) = 385$, then $(x + 15) =$ _____

*(40) $\sqrt{5102123} =$ _____

(41) A triangle has sides of 9, x, and 13. What is the greatest integral value of x? _____

(42) $20 + 15 + 35 + 50 + 85 + 135 + 220 + 355 =$____

(43) If $11^5 \times 11^6 \div 11^k = 11^4$, then k = _____

(44) Find the slope of a line perpendicular to the line containing the points (— 2, — 1) and (3, 4). _____

(45) 72% of $833\frac{1}{3} =$ _____

(46) A set containing k elements has 1023 proper subsets. Find k. _____

(47) If $4^{(x+1)} = 8^{(x-1)}$ then x = _____

(48) If A is 20% more than B and B is 10% less than C, then A is _____ % more than C.

(49) $321_4 \div 3_4 =$ _____ 4

*(50) 271.8 $\times$ (e)$^3 =$ _____

(51) If $\log_x (2744) = 3$ then x = _____

(52) The point (3, 1) is reflected across the line y = x to the point (h, k). Find k. _____

(53) $6^3 \div 3^3 \times (1.5)^3 =$ _____

(54) If y varies inversely with x and y = 12 when x = 8, find x when y = 4. _____

(55) $13^4 \div 11$ has a remainder of _____

(56) If $\frac{2x}{7}$ has a remainder of 5 and $\frac{3y}{7}$ has a remainder of 4 then $\frac{xy}{7}$ has a remainder of _____

(57) $\frac{6!}{8!} = \frac{(x-2)!}{x!}$. Find x, where $x < 0$. _____

(58) $11 \times \frac{14}{17} =$ _____ (mixed number)

(59) $215 \times 321 =$ _____

*(60) $16^3 \times 8^3 \div 4^3 =$ _____

(61) $1 - 2\sin^2\left(\frac{2\pi}{3}\right) =$ _____

(62) $2015_8 =$ _____ 2

(63) f(x) = $5x^2$ — 7 and g(x) = 4 — 2x. f(g(3)) = _____

(64) If ln(27) = kln(3) — 2ln(3), then k = _____

(65) How many positive integers less than 63 are relatively prime to 63? _____

(66) Change 0.4666... $_8$ to a base 10 fraction. _____

(67) The base of a triangle is 16". If the altitude is increased from 10" to 13", the corresponding increase in the area is _____ sq. in.

(68) The determinant of $\begin{bmatrix} -1 & -6 \\ 3 & 10 \end{bmatrix}$ is _____

(69) The horizontal phase shift of $f(\theta) = 3\cos(4\pi\theta - 6\pi) + 5$ is _____

*(70) The volume of a sphere with a diameter of 24 cm is _____ cu. cm

(71) $F(x) = x^4 + 4x^3 + 6x^2 + 4x + 1$. $F'(-1) =$ _____

(72) The Greatest Integer Function is written as $f(x) = [x]$. Find $\left[\sqrt{6} + \sqrt{7}\right]$. _____

(73) The harmonic mean of the roots of $x^3 - \frac{13}{12}x^2 - \frac{5}{12}x + \frac{1}{2} = 0$ is _____

(74) If $f(x) = 5 + \frac{2x}{3}$, then $f^{-1}(1) =$ _____

(75) $\int_{-1}^{1} (2 - x^3)\, dx =$ _____

(76) The third largest *perfect* number is _____

(77) 0.2353535... $_6 =$ _____ $_6$ (proper fraction)

(78) GCD(k, 24) = 6. LCM(k, 24) = 72. k = _____

(79) $143 \times 49 = 1001 \times$ _____

*(80) $\sqrt[3]{3212015} =$ _____

The University Interscholastic League
Number Sense Test ● HS District 1 ● 2015

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(1) $323 + 2015 =$ _____

(2) $2015 - 328 =$ _____

(3) $28 \times 15 =$ _____

(4) $2015 \div 3 =$ _____ **(mixed number)**

(5) $28^2 =$ _____

(6) $\frac{8}{125} =$ _____ **% (decimal)**

(7) $20\frac{1}{5} + 3\frac{2}{3} =$ _____ **(mixed number)**

(8) **15 is** _____ **% of 2000**

(9) **The LCM of 57 and 95 is** _____

***(10)** $32328 + 3232 + 323 + 32 =$ _____

(11) $5\frac{1}{20} - 8\frac{2}{3} =$ _____ **(mixed number)**

(12) **1 yard — 2feet — 3 inches =** _____ **inches**

(13) $|3 - 2| - 3 + |3 - 2| + |8 - 15| =$ _____

(14) **MMDCCLXXVII =** _____ **(Arabic Number)**

(15) $25 \times 23 + 28 \times 25 =$ _____

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

(17) $13^3 =$ _____

(18) $20 - 15 \div 3 \times 23 + 3 \times 2 - 8 =$ _____

(19) $123 \times 14 =$ _____

***(20)** $510214 \div 283 =$ _____

(21) $8\frac{2}{3} \times 5\frac{1}{2} =$ _____ **(mixed number)**

(22) $(14 + 92 \times 17 - 76) \div 8$ **has a remainder of** ____

(23) **If** $x + (x + 3) + (x + 6) + (x + 9) + (x + 12) = 90$, **then** $(x + 6) =$ _____

(24) $23^2 + 69^2 =$ _____

(25) $\sqrt{216} - \sqrt{150} = \sqrt{x}$ **. Find x.** _____

(26) **If 15 ⊙ s cost $22.50 then 8 ⊙ s cost $** _____

(27) **Find the ratio of the perimeter of a 4" x 5" rectangular picture to its area.** _____

(28) **3233282015 ÷ 9 has a remainder of** _____

(29) **If** $x = 23$ **and** $y = 28$ **then** $x^2 - 2xy + y^2 =$ _____

***(30)** $\sqrt{325} \times \sqrt{398} =$ _____

(31) $4\frac{7}{12} \div 1\frac{5}{6} =$ _____ **(mixed number)**

(32) $6! - 5! + 4! - 3! + 2! - 1! =$ _____

(33) **How many subsets of the set {l,u,c,a,s} are 4-element or 1-element subsets?** _____

(34) 25% of 35 less 45 is _____

(35) Change 323 base 10 to base 8. _____ 8

(36) Round $\sqrt{5}$ to the thousandth place. _____

(37) $58^2 + 75^2$ = _____

(38) $|3x - 2| = 8$. Find x, where $x \geq 0$. _____

(39) $323_4 + 232_4 + 233_4$ = _____ 4

*(40) $57 \times 68 \times 79$ = _____

(41) $21 \times \frac{23}{25}$ = _____ (mixed number)

(42) The sum of the roots of $27x^2 + 15x = 2$ is _____

(43) If $7^7 \times 7^{-3} \div 7^k = 7^6$, then k = _____

(44) Find the slope of a line containing the points $(-3, 2)$ and $(3, -8)$. _____

(45) $7 + 8 + 15 + 23 + 38 + \ldots + 160$ = _____

(46) A set containing k elements has 255 proper subsets. Find k. _____

(47) $516\frac{2}{3}\%$ of 24 is = _____

(48) $(4 - 9i)(5 + 2i) = a + bi$. Find $a - b$. _____

(49) $322_8 \div 6_8$ = _____ 8

*(50) $\sqrt{23282015}$ = _____

(51) Let $\frac{6!}{4!} = \frac{(x-1)!}{x!}$. Find x. _____

(52) If $\log_8(4) = x$, then x = _____

(53) $12^3 \div 6^3 \times 3^3$ = _____

(54) 328×323 = _____

(55) The first 4 digits of the decimal of $\frac{31}{90}$ is 0._____

(56) If $\frac{3x}{5}$ has a remainder of 2 and $\frac{2y}{5}$ has a remainder of 3 then $\frac{xy}{5}$ has a remainder of _____

(57) The point $(-3, -1)$ is reflected across the line $x = 2$ to the point (h, k). Find $h + k$. _____

(58) ${}_7P_4$ = _____

(59) $34^5 \div 11$ has a remainder of _____

*(60) $9^4 \div 6^3 \times 3^2$ = _____

(61) If $\sec\theta = 2.8$ then $\cos\theta$ = _____

(62) The greatest integer function $f(x) = [x + 1]$ has a value of _____ for $f(\sqrt{8})$

(63) $0.353535\ldots_6$ = _____ 6 (proper fraction)

(64) How many positive integers less than or equal to 28 are relatively prime to 28? _____

(65) The simplified coefficient of the x^2y^2 term in the expansion of $(2x + 3y)^4$ is _____

(66) Find k, $0 \leq k \leq 6$, if $3k + 2 \cong 3 \pmod 7$. _____

(67) If $g(x) = \frac{3 + 2x}{3}$, then $g^{-1}(15)$ = _____

(68) If $\ln(216) = 3\ln(2) + k\ln(3)$, then k = _____

(69) The probability of randomly selecting a triangular number from the set of the first 20 natural numbers is _____%

*(70) 8571.42×55 = _____

(71) Let $f(x) = x^5 + 5x^4 + 10x^3 + 10x^2 + 5x + 1$. Find $f'(4)$. _____

(72) Find k if $\begin{vmatrix} k & -4 \\ 4 & -6 \end{vmatrix} = 1$. k = _____

(73) The perimeter of a square is increased from 12" to 20". Find the corresponding increase in the area is _____ sq. in.

(74) $999 \times \frac{27}{37}$ = _____

(75) $\int_{-1}^{2} (2x - 1)\,dx$ = _____

(76) Find the slope of the line tangent to $y = 3x^2 + 2x - 8$ at $x = -2$. _____

(77) The graph of $y = x + \frac{1}{x}$ has _____ asymptote(s)

(78) If $f(x) = 2x^3 + 7x^2 - 2x - 15$, then $f''(1)$ = _____

(79) $143 \times 630 = 1001 \times$ _____

*(80) $\sqrt[3]{8232015}$ = _____

The University Interscholastic League
Number Sense Test • HS District 2 • 2015

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(1) $4611 + 2015 =$ _____

(2) $6040 - 5102 =$ _____

(3) $11.4 \times 6 =$ _____ **(decimal)**

(4) $1511 \div 4 =$ _____ **(mixed number)**

(5) $\frac{3}{8}\% =$ _____ **(decimal)**

(6) $0.363636... =$ _____ **(proper fraction)**

(7) $4\frac{1}{6} + 2\frac{1}{5} =$ _____ **(mixed number)**

(8) $4 \times (6 - 11) + 20 \div 15 =$ _____

(9) $16^2 =$ _____

***(10)** $20154 + 61115 =$ _____

(11) 78.4 is 28% of _____

(12) One-sixteenth of 1 gallon is _____ fluid ounces

(13) $6\frac{1}{4} - 1\frac{2}{5} =$ _____ **(mixed number)**

(14) $1 + 4 + 7 + 10 + ... + 40 =$ _____

(15) $76 - 56 - 36 - 64 - 44 + 24 =$ _____

(16) The GCF of 57, 95, and 133 is _____

(17) $15 \times 35 + 11 \times 15 =$ _____

(18) MMXV + DCXI = _____ (Arabic Number)

(19) $27 \times \frac{27}{31} =$ _____ **(mixed number)**

***(20)** $51021 \div 164 =$ _____

(21) $33^2 + 99^2 =$ _____

(22) $(46 \times 11 + 51) \div 8$ has a remainder of _____

(23) $4\frac{2}{5} \times 6\frac{5}{11} =$ _____ **(mixed number)**

(24) Change 75 base 10 to base 6. _____ 6

(25) Find the simple interest on $1200 at 9% for 6 months. $ _____

(26) The number of positive integral divisors of 116 is _____

(27) If $4^3 - 3^4 - 2^5 = 7k$, then $k^2 =$ _____

(28) $0.4222... =$ _____ **(proper fraction)**

(29) If $x + (x + 5) + (x + 10) + ... + (x + 40) = 360$ then $(x + 20) =$ _____

***(30)** $\sqrt{731} \times \sqrt[3]{1329} =$ _____

(31) The product of a number x and 4 has the save value as the sum of x and 13. Find x. _____

(32) If $x = 6$ and $y = 11$ then $4x^2 - 4y^2 =$ _____

(33) How many subsets containing only 3 elements does the set {d,e,c,i,m,a,l} have? _____

(34) $4611_7 - 2015_7$ = _____ $_7$

(35) The length of a rectangle is twice the width. Find the area if the perimeter is 24". _____ sq. in

(36) $(0.25)^{-2} + (0.5)^{-1} + (0.75)^0$ = _____

(37) 45% of $566\frac{2}{3}$ = _____

(38) $4\frac{2}{5} \div 1\frac{19}{25}$ = _____ (mixed number)

(39) Truncate $\sqrt{3} + \sqrt{5}$ to the tenths place. _____

*(40) $406 \times 411 \div 215$ = _____

(41) If $9^8 \div 9^9 \times 9^k = 9^{11}$, then k = _____

(42) $5 + 7 + 12 + 19 + ... + 131$ = _____

(43) $44 \times 0.454545...$ = _____

(44) The point (3, 8) is reflected across the line $y = -2$ to the point (h, k). Find $h + k$. _____

(45) P,Q, and R are the roots of $2x^3 - 9x^2 - 2x + 8 = 0$. Find PQ + PR + QR + PQR. _____

(46) If $2x + y = 1$ and $x - y = 3$ then y = _____

(47) $(4 + 6i)(20 + 15i) = a + bi$. Find a — b. _____

(48) $14 \times \frac{17}{20}$ = _____ (mixed number)

(49) The area of a right triangle with a base of 24" and a hypotenuse of 25" is _____ sq. in

*(50) The volume of a sphere with a radius of 30 cm is _____ cm^3

(51) Let $2\log_3(x) = 4$. Find $x > 0$. _____

(52) 411×406 = _____

(53) $202_5 \div 4_5$ has a remainder of _____ $_5$

(54) Let $\frac{5!}{(x-1)!} = \frac{4!}{(x-2)!}$. Find x. _____

(55) The coefficient of the x^3y^2 term when $(2x + 3y)^5$ is expanded is _____

(56) $14^2 \div 7^2 \times (3.5)^2$ = _____

(57) How much time has passed from 8:00 a.m. on 4/6/14 to 5:00 p.m. on 4/11/14? _____ hours

(58) The first 4 digits of the decimal of $\frac{211}{990}$ is 0._____

(59) The smaller root of $5x^2 + 7x - 6 = 0$ is _____

*(60) $38^2 \div 22^3 \times 9^4$ = _____

(61) $2\cos^2\left(\frac{2\pi}{3}\right) - 1$ = _____

(62) Change $0.3666..._7$ to a base 10 fraction. _____

(63) $f(x) = x^2 + 2x - 3$ and $g(x) = 3 - x$. f(g(2)) = _____

(64) If $2\ln(8) = \ln(k) + 3\ln(2)$, then k = _____

(65) The determinant of $\begin{bmatrix} 11 & 7 \\ 3 & k \end{bmatrix} = -12$. k = _____

(66) How many positive integers less than 44 are relatively prime to 44? _____

(67) The base of a triangle is 10". If the altitude is increased from 12" to 15", the corresponding increase in the area is _____ sq. in.

(68) $(\cos 15° \cos 45° + \sin 15° \sin 45°)^2$ = _____

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

*(70) $(3e + 2\pi)^3$ = _____

(71) Let $F(x) = (2x + 1)^4$. Find $F'(-3)$. _____

(72) $0.313131..._5$ = _____ $_5$ (proper fraction)

(73) The frequency of $y = 2 - 3\cos(\pi x - 1)$ is _____

(74) $\frac{1}{3} + \frac{1}{6} + \frac{1}{10} + \frac{1}{15} + \frac{1}{21} + \frac{1}{28}$ = _____

(75) The greatest value of k such that ${}_8C_k = 56$ is _____

(76) $\lim_{x \to -3} \frac{x^2 - 9}{x + 3}$ = _____

(77) The sum of the factors of the *perfect* number x, where $10 < x < 50$ is _____

(78) $\int_{-1}^{2} (4x)\, dx$ = _____

(79) $12^3 - 14^3$ = _____

*(80) $833 \div \frac{5}{12} \times 0.19666...$ = _____

The University Interscholastic League
Number Sense Test • HS Regional • 2015

Final _____ _____

Contestant's Number _____ 2nd _____ _____

1st _____ _____

Score **Initials**

Read directions carefully before beginning test

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STOP -- WAIT FOR SIGNAL!

(1) $2015 - 425 =$ _____

(2) $5.24 + 510.2 =$ _____ **(decimal)**

(3) $248 \times 15 =$ _____

(4) $154 \div 25 =$ _____ **(decimal)**

(5) $36\% =$ _____ **(proper fraction)**

(6) $42515 \div 11$ **has a remainder of** _____

(7) $5\frac{1}{2} - 4\frac{2}{5} =$ _____ **(mixed number)**

(8) $[4 \times (2 - 5) + 2^0 - 1] \div 15 =$ _____

(9) $23^2 =$ _____

***(10)** $5102 + 524 + 425 + 2015 =$ _____

(11) $9.090909...\% =$ _____

(12) **2 gallons — 2 quarts — 2 pints = ____ fluid ounces**

(13) $47 \times 74 =$ _____

(14) $4 + 8 + 12 + 16 + ... + 44 + 48 =$ _____

(15) **MMDCCCXV =** _____ **(Arabic Numeral)**

(16) $4\frac{2}{5} + 4\frac{1}{4} =$ _____ **(mixed number)**

(17) $428 \times 12 =$ _____

(18) **If 20 YURs cost $24.48 then 15 YURs cost $_____**

(19) $14^3 =$ _____

***(20)** $4.23 \times 42.8 \times 2015 =$ _____

(21) $(23 \times 28 + 15) \div 4$ **has a remainder of** _____

(22) $23^2 + 69^2 =$ _____

(23) $5\frac{1}{2} \div 4\frac{2}{5} =$ _____ **(mixed number)**

(24) $5102_6 =$ _____ **10**

(25) **Set A has 8 elements and set B has 11 elements. If $A \cap B$ has 5 elements, then $A \cup B$ has ___ elements**

(26) **If** $4x + 2 = 8$ **then** $2x - 15 =$ _____

(27) **If** $x = 15$ **and** $y = 28$ **then** $x^2 - 2xy + y^2 =$ _____

(28) **Find the ratio of the perimeter of a 3.5" x 6" rectangle to its area.** _____

(29) **0.2888...** _____ **(proper fraction)**

***(30)** $\sqrt{627} \times \sqrt{959} =$ _____

(31) **30% of 60 less 90 is** _____

(32) $20_9 + 15_9 + 428_9 =$ _____ **9**

(33) **How many subsets containing only 4 elements does the set {f,r,a,c,t,i,o,n} have?** _____

(34) $3\frac{1}{8} \times 3\frac{3}{5} =$ _____ **(mixed number)**

(35) 28 is divisible by how many natural numbers? ___

(36) $23 \times \frac{26}{29}$ = _____ (mixed number)

(37) Truncate $\sqrt{7}$ to the tenth place. _____

(38) $(0.111...)^{-2} + (0.125)^{-1} - (1.5)^{0}$ = _____

(39) If $x + (x + 3) + (x + 6) + ... + (x + 15) + (x + 18)$ equals 91, then $(x + 9)$ = _____

*(40) $\sqrt{5102824}$ = _____

(41) The sum of the roots of $4x^3 - 8x^2 + x + 3 = 0$ is S and the product of the roots is P. S + P = _____

(42) $(2 - i)(5 - 3i) = a + bi$. Find a + b. _____

(43) 25×0.3125 = _____

(44) $266\frac{2}{3}\%$ of 36 = _____

(45) The arithmetic mean of 23, 37, 19, & 29 is _____

(46) How many positive integers less than 45 are relatively prime to 45? _____

(47) The first 4 digits of the decimal of $\frac{419}{990}$ is 0._____

(48) A 20 element set has _____ improper subsets

(49) The point (— 3, — 5) is reflected across the line y = x to the point (h, k). Find h + k. _____

*(50) 2015423 ÷ 428 = _____

(51) ${}_6P_2$ = _____

(52) The odds of randomly selecting a composite number from $\{x \mid 0 < x < 20\}$ is _____

(53) $43^2 + 26^2$ = _____

(54) $3 + 7 + 10 + 17 + ... + 71 + 115 + 186$ = _____

(55) Let $\frac{9!}{8!} = \frac{(x - 1)!}{x!}$. Find x. _____

(56) $202_7 \div 5_7$ = _____ 7

(57) $10^2 \div 5^2 \times (2.5)^2$ = _____

(58) The probability of randomly selecting a Fibonacci number from the set of odd digits is _____%

(59) 323×325 = _____

*(60) $33^3 \div 22^2 \times 11$ = _____

(61) If $\csc\theta = 1.4$ then $\sin\theta$ = _____

(62) f(x) = 2x + 3 and g(x) = 2 — 5x. g(f(— 1)) = _____

(63) $\left|\begin{bmatrix} -2 & 5 \\ 1 & 5 \end{bmatrix}\right|$ = _____

(64) The amplitude of $y = 1 - 2\sin 3\pi(4\theta - 5)$ is _____

(65) Change $0.7444..._8$ to a base 8 fraction. _____ 8

(66) The simplified coefficient of the x^3y term in the expansion of $(2x + 5y)^4$ is _____

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

(68) The Greatest Integer Function is written as f(x) = [x]. Find $\left[\sqrt{2} + \sqrt{5}\right]$. _____

(69) The harmonic mean of the roots of $x^3 - 7x^2 + 12x - 6 = 0$ is _____

*(70) 5714.28×63 = _____

(71) Let $F(x) = (3x + 1)^3$. Find $F'(-2)$. _____

(72) The base of a triangle is 18 cm. If the altitude is increased from 9 cm to 12 cm, the corresponding increase in the area is _____ sq. cm.

(73) $143 \times 77 = 1001 \times$ _____

(74) If ln(10) = ln(80) — kln(2), then k = _____

(75) $\int_{-1}^{1} (2x - 3)\,dx$ = _____

(76) GCD(40, k) = 8. LCM(40, k) = 280. k = _____

(77) $12^3 + 13^3$ = _____

(78) $\sum_{k=1}^{3} (-k)^3$ = _____

(79) $110101_2 + 10111011_2$ = _____ 8

*(80) 96 rods is equivalent to _____ yards

The University Interscholastic League
Number Sense Test ● HS State ● 2015

Final _____ _____

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STOP -- WAIT FOR SIGNAL!

(1) $526 + 2015 =$ _____

(2) $822 - 526 =$ _____

(3) $26 \times 15 =$ _____

(4) $20.15 \div 5 =$ _____ (decimal)

(5) $\frac{1}{9} =$ _____% (mixed number)

(6) $26^2 =$ _____

(7) 0.41666... = _____ (proper fraction)

(8) $5 \div 10 + 2 \times 6 - 2 \times 5 =$ _____

(9) $2\frac{5}{6} + 20\frac{1}{5} =$ _____ (mixed number)

***(10)** $52620 + 52815 =$ _____

(11) The GCD of 48 and 72 is _____

(12) MCXI + DLV = _____ (Arabic Number)

(13) $25 \times 26 + 25 \times 28 =$ _____

(14) $2 + 5 + 8 + 11 + ... + 41 =$ _____

(15) $6\frac{2}{5} - 5\frac{1}{2} =$ _____

(16) 5 yards + 2 feet + 6 inches = _____ inches

(17) The average of 5, 26, 20, and 15 is _____

(18) $23 \times 45 =$ _____

(19) $13^3 =$ _____

***(20)** $135 \times 246 + 789 =$ _____

(21) $(5 \times 26 - 20 + 15) \div 6$ has a remainder of _____

(22) If 6 ♦s cost $8.50 then 15 ♦s cost $ _____

(23) $1\frac{2}{3} \times 2\frac{3}{4} =$ _____ (mixed number)

(24) Change 526_{10} to base 5. _____$_5$

(25) $\sqrt{54} - \sqrt{24} = \sqrt{x}$. Find x. _____

(26) $26^2 + 78^2 =$ _____

(27) 0.2666... = _____ (proper fraction)

(28) Find the ratio of the perimeter of a 5" x 8" rectangular note card to its area. _____

(29) $6! \div 2! + 5! =$ _____

***(30)** $\sqrt{6255102} =$ _____

(31) $26^2 - 25^2 =$ _____

(32) $76_8 + 54_8 - 32_8 =$ _____$_8$

(33) How many subsets containing only 2 or 3 elements does the set {T,M,S,C,A} have? _____

(34) $5\frac{1}{2} \div 4\frac{2}{5} =$ _____ (mixed number)

(35) If $x + (x + 5) + (x + 10) + (x + 15) + ... + (x + 45) + (x + 50) = 341$, then $(x + 25) =$ _____

(36) The number of positive integral divisors of 48 is___

(37) Let $3^x = 243$. Find x^3. _____

(38) If $x = 6$ and $y = 7$, then $x^3 + 3x^2y + 3xy^2 + y^3 =$ _____

(39) Round $\sqrt{3} + \sqrt{6}$ to the tenths place. _____

*(40) $5^4 \div 2^3 \times 6^2 =$ _____

(41) $11 \times \frac{14}{17} =$ _____ (mixed number)

(42) The ratio of the sum of the roots to the product of the roots of $3x^2 + 2x - 1 = 0$ is _____

(43) $\frac{1}{15} + \frac{1}{35} + \frac{1}{63} + \frac{1}{99} =$ _____

(44) 18% of 188.888... = _____

(45) The point $(2, -4)$ is reflected across the line $y = -x$ to the point (h, k). Find $h + k$. _____

(46) Find the slope of a line containing the points $(-2, 3)$ and $(5, -7)$. _____

(47) $(5 + 2i)(6 - 15i) = a + bi$. Find $a + b$. _____

(48) $42^2 - 52^2 + 62^2 - 72^2 =$ _____

(49) A triangle has sides of 7, 24, and x. What is the greatest integral value of x? _____

*(50) $33 \times 66 \times 99 =$ _____

(51) ${}_6P_2 \div {}_5C_3 =$ _____

(52) Let $\frac{9!}{11!} = \frac{(x-3)!}{(x-2)!}$. Find x. _____

(53) $6250_8 \div 6_8 =$ _____ 8

(54) $1 + 8 + 9 + 17 + ... + 69 + 112 =$ _____

(55) If $2\log_4(2x) = 4$ then $x =$ _____

(56) $(0.0625)^2 \div (0.125)^2 \times (0.25)^2 =$ _____

(57) How much time has passed from 6:45 a.m. to 5:10 p.m. the same day? _____ minutes

(58) $526 \times 215 =$ _____

(59) The odds of randomly selecting a square number from the set of the first 20 natural numbers is ____

*(60) $510^2 \div 26^2 \times 25^2 =$ _____

(61) How many positive integers less than 54 are relatively prime to 54? _____

(62) $6\sin(165°)\cos(165°) =$ _____

(63) If $\ln(108) = \ln(4) + 3\ln(k)$, then $k =$ _____

(64) $22^2 + 24^2 =$ _____

(65) The perimeter of a square is increased from 12" to 16". Find the corresponding increase in the area of the square. _____ sq. in.

(66) The simplified coefficient of the x^2y^2 term in the expansion of $(3x + 5y)^4$ is _____

(67) $0.4111..._8 =$ _____ 8 (proper fraction)

(68) If $f(x) = \frac{5x-2}{6}$, then $f^{-1}(-2) =$ _____

(69) If $f(x) = 5x^3 + x^2 - 2$, then $f''(0) =$ _____

*(70) The surface area of a sphere with a diameter of 26 cm is _____ sq. cm

(71) Change $0.5222..._6$ to a base 10 fraction. _____

(72) Find k if $\begin{vmatrix} 2k & -1 \\ 3 & 4 \end{vmatrix} = 5$. $k =$ _____

(73) $\lim_{x \to 5} \frac{x^2 - 25}{x - 5} =$ _____

(74) $9^3 + 11^3 =$ _____

(75) The graph of $y = \frac{x^3 + 1}{x^2 - 1}$ has _____ asymptote(s)

(76) Write using numbers: five million two hundred sixty-two thousand fifteen. _____

(77) The Greatest Integer Function is written as $f(x) = [x]$. Find $\left[\sqrt{2} + \sqrt{5} + \sqrt{8}\right]$. _____

(78) $143 \times 567 = 1001 \times$ _____

(79) $120021_3 + 21002112_3 =$ _____ 9

*(80) $1875 \div 0.3125 \times \frac{7}{16} =$ _____

University Interscholastic League - Number Sense Answer Key HS ● SAC ● Fall 2014

***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) 2,927

(2) 9.136

(3) 2,000

(4) 403

(5) $\frac{3}{8}$

(6) 1,158

(7) $1\frac{1}{20}$

(8) 289

(9) 4

***(10) 2,913 — 3,219**

(11) 24

(12) 774

(13) 351

(14) $20\frac{8}{15}$

(15) 780

(16) 176

(17) 360

(18) $19.11

(19) $\frac{6}{11}$

***(20) 526 — 581**

(21) 90

(22) 6

(23) 104

(24) .75

(25) $8.25

(26) $8\frac{3}{4}$

(27) 12

(28) 1,000

(29) 10

***(30) 26,610 — 29,410**

(31) 30,210

(32) 100

(33) 20

(34) 3,133

(35) — 1

(36) 324

(37) 30

(38) $\frac{5}{6}$

(39) 10

***(40) 19,220 — 21,242**

(41) 12

(42) — 6

(43) 30

(44) 18

(45) 8

(46) 186

(47) $-1.5, -\frac{3}{2}, -1\frac{1}{2}$

(48) 13

(49) 5

***(50) 3,461 — 3,824**

(51) 10

(52) 32

(53) 12

(54) 27

(55) 26

(56) 2323

(57) 2

(58) 61,306

(59) 60

***(60) 87 — 95**

(61) 2

(62) 12,096

(63) $\frac{22}{23}$

(64) 6

(65) 12

(66) 22

(67) 3

(68) — 1

(69) $-.5, -\frac{1}{2}$

***(70) 108 — 118**

(71) 12

(72) 54

(73) $\frac{12}{7}, 1\frac{5}{7}$

(74) 30

(75) 2

(76) 5

(77) 6

(78) 27

(79) 22

***(80) 199 — 219**

University Interscholastic League - Number Sense Answer Key HS ● Invitation A ● 2015

***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) 3,942

(2) — 2,113

(3) 3,210

(4) $223\frac{8}{9}$

(5) 196

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

(7) $35\frac{25}{63}$

(8) 4

(9) — 5

***(10) 30,054 — 33,216**

(11) $\frac{5}{6}$

(12) 315

(13) 3,290

(14) $-2\frac{13}{30}$

(15) 406

(16) 1,529

(17) 169

(18) 63

(19) 10

***(20) 44,474 — 49,154**

(21) 24

(22) $62.50

(23) $4\frac{2}{3}$

(24) 1,960

(25) .9, $\frac{9}{10}$

(26) 29

(27) 0

(28) 8

(29) 117

***(30) 143 — 157**

(31) $2\frac{1}{4}$

(32) 2

(33) 8

(34) 1.414

(35) 18

(36) 10

(37) 196

(38) 81

(39) 3.5, $\frac{7}{2}$, $3\frac{1}{2}$

***(40) 2,421 — 2,675**

(41) $\frac{36}{2525}$

(42) 273

(43) — 20

(44) $12\frac{2}{15}$

(45) .5, $\frac{1}{2}$

(46) 25

(47) 34

(48) 32

(49) 442

***(50) 967 — 1,068**

(51) 0

(52) 7

(53) 32,886

(54) 21

(55) $\frac{60}{13}$, $4\frac{8}{13}$

(56) 3

(57) — 1

(58) $\frac{3}{13}$

(59) 2532

***(60) 244 — 268**

(61) $\frac{5}{10}$

(62) 3

(63) .5, $\frac{1}{2}$

(64) 2

(65) 6

(66) 999

(67) 16

(68) — 1

(69) 79

***(70) 5,012 — 5,539**

(71) 2.25, $\frac{9}{4}$, $2\frac{1}{4}$

(72) $\frac{17}{6}$, $2\frac{5}{6}$

(73) 80

(74) .5, $\frac{1}{2}$

(75) 60

(76) 16

(77) 1

(78) 1.5, $\frac{3}{2}$, $1\frac{1}{2}$

(79) .2, $\frac{1}{5}$

***(80) 533 — 588**

University Interscholastic League - Number Sense Answer Key HS ● Invitation B ● 2015

***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) — 10,100

(2) $671\frac{2}{3}$

(3) 232.9

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

(5) 2.75

(6) $\frac{5}{16}$

(7) 5,100

(8) 37

(9) 225

***(10) 22,122 — 24,450**

(11) 19

(12) 19

(13) 242

(14) $-\frac{11}{12}$

(15) 2,095

(16) 3,375

(17) — .49, $-\frac{49}{100}$

(18) 25

(19) 213

***(20) 953,069 — 1,053,391**

(21) 23.45, $\frac{469}{20}$, $23\frac{9}{20}$

(22) 2,250

(23) 12

(24) 314

(25) — 8

(26) $-\frac{47}{1225}$

(27) $\frac{149}{990}$

(28) 961

(29) 3,240

***(30) 211 — 232**

(31) 8

(32) 10

(33) 242

(34) 8

(35) $30.20

(36) 1.5625, $\frac{25}{16}$, $1\frac{9}{16}$

(37) 20

(38) $13\frac{8}{19}$

(39) 210

***(40) 25,536 — 28,224**

(41) 10

(42) — 15

(43) 2.4

(44) 510

(45) — 1

(46) $-\frac{5}{3}$, $-1\frac{2}{3}$

(47) — 1.5, $-\frac{3}{2}$, $-1\frac{1}{2}$

(48) 50

(49) 240

***(50) 299 — 329**

(51) 8

(52) 3

(53) 15

(54) 57

(55) 32

(56) 3222

(57) 781

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

(59) 66,882

***(60) 713 — 788**

(61) .8, $\frac{4}{5}$

(62) $\frac{211}{330}$

(63) 5

(64) 8

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

(66) 4

(67) 41

(68) 32,623

(69) 1.4, $\frac{7}{5}$, $1\frac{2}{5}$

***(70) 4,885,710 — 5,399,994**

(71) 77

(72) 8

(73) 22

(74) 2

(75) 34

(76) — 6

(77) .5, $\frac{1}{2}$

(78) 20,375,000,000

(79) 2,044

***(80) 4,922 — 5,440**

2014-15 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) 3,220

(2) 808

(3) $335\frac{2}{3}$

(4) 3,300

(5) .004

(6) 225

(7) 8

(8) — 58

(9) $8\frac{3}{4}$

***(10) 7,703 — 8,513**

(11) $8\frac{1}{12}$

(12) 55

(13) 6

(14) 1,111

(15) 3,375

(16) $\frac{194}{3}$, $64\frac{2}{3}$

(17) $13\frac{16}{21}$

(18) 3,424

(19) 380

***(20) 3,349 — 3,700**

(21) 7.5

(22) 5

(23) 73

(24) $\frac{2}{11}$

(25) 175

(26) $\frac{7}{18}$

(27) 640

(28) 36

(29) 15

***(30) 8,445 — 9,333**

(31) 21

(32) 50

(33) $2\frac{8}{9}$

(34) 606

(35) $3.60

(36) $-\frac{5}{3}$, $-1\frac{2}{3}$

(37) 4,545

(38) $6\frac{11}{14}$

(39) 225

***(40) 38,282 — 42,310**

(41) 4

(42) 17.1, $\frac{171}{10}$, $17\frac{1}{10}$

(43) 48

(44) $\frac{2}{9}$

(45) 72

(46) 124

(47) 100

(48) 327

(49) 6.5, $\frac{13}{2}$, $6\frac{1}{2}$

***(50) 3,300 — 3,646**

(51) $\frac{34}{3}$, $11\frac{1}{3}$

(52) 32

(53) 1

(54) 1

(55) 1,728

(56) — 1

(57) 26,964

(58) $\frac{5}{3}$, $1\frac{2}{3}$

(59) — .875, $-\frac{7}{8}$

***(60) 80,925 — 89,443**

(61) 5,776

(62) $\frac{5}{8}$

(63) 10

(64) 1,252

(65) $-\frac{4}{3}$, $-1\frac{1}{3}$

(66) 216

(67) 20

(68) .75, $\frac{3}{4}$

(69) .5, $\frac{1}{2}$

***(70) 192 — 211**

(71) 7

(72) 0

(73) 4

(74) — 1

(75) .75, $\frac{3}{4}$

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

(77) $\frac{5}{7}$

(78) 1777

(79) 14

***(80) 998 — 1,102**

2014-15 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) 62,330

(2) 3,168

(3) 5,472

(4) 476.875

(5) 3.6

(6) 1,156

(7) 9.6, $\frac{48}{5}$, $9\frac{3}{5}$

(8) 3,400

(9) 252

***(10) 7,542 — 8,334**

(11) 4,620

(12) .725, $\frac{29}{40}$

(13) 42

(14) 3,154

(15) 105

(16) 12

(17) 80

(18) $27\frac{16}{35}$

(19) 3

***(20) 1,172,989 — 1,296,461**

(21) 17.5, $\frac{35}{2}$, $17\frac{1}{2}$

(22) 1

(23) 2,744

(24) $8\frac{4}{15}$

(25) $28.13

(26) 119

(27) 1,210

(28) $2.40

(29) 5

***(30) 72,714,943 — 80,369,147**

(31) 1.8, $\frac{9}{5}$, $1\frac{4}{5}$

(32) 16

(33) 224

(34) 0

(35) — 56

(36) .6, $\frac{3}{5}$

(37) 56

(38) 77

(39) $9\frac{8}{15}$

***(40) 143,384 — 158,476**

(41) 8

(42) 6

(43) 30

(44) — 8

(45) 48

(46) 216

(47) 207

(48) 42

(49) 54

***(50) 16,677 — 18,431**

(51) 70

(52) 9

(53) 129,480

(54) 10

(55) 34

(56) 12

(57) — 3

(58) 2555

(59) 43

***(60) 18,699 — 20,667**

(61) — 928

(62) 4

(63) $\frac{5}{12}$

(64) 33.75, $\frac{135}{4}$, $33\frac{3}{4}$

(65) .5, $\frac{1}{2}$

(66) 3

(67) $\frac{15}{70}$

(68) — $\frac{2}{3}$

(69) .8, $\frac{4}{5}$

***(70) 528 — 583**

(71) 52

(72) 2

(73) 34

(74) 441

(75) $\frac{41}{330}$

(76) 3,220,000,000

(77) — 2

(78) .5, $\frac{1}{2}$

(79) 144

***(80) 1,720 — 1,900**

2014-15 TMSCA High School State Meet Number Sense - 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) 2,015

(2) 322

(3) 2,568

(4) 503.75

(5) 1,089

(6) 5

(7) $23\frac{7}{10}$

(8) $\frac{11}{3}$, $3\frac{2}{3}$

(9) $\frac{17}{500}$

***(10) 3,121 — 3,449**

(11) $2\frac{1}{18}$

(12) 6

(13) $\frac{200}{3}$, $66\frac{2}{3}$

(14) 48

(15) 261

(16) 17

(17) $10\frac{5}{22}$

(18) 321

(19) 4,554

***(20) 191,475 — 211,629**

(21) $22\frac{2}{9}$

(22) 12

(23) 1,690

(24) 25

(25) 228

(26) $38.00

(27) .45, $\frac{9}{20}$

(28) 31

(29) 4

***(30) 3,162 — 3,494**

(31) 322

(32) 341

(33) 20

(34) 6,424

(35) $1\frac{7}{8}$

(36) 9

(37) 11001

(38) 4

(39) 55

***(40) 2,146 — 2,371**

(41) 21

(42) 915

(43) 7

(44) — 1

(45) 600

(46) 10

(47) 5

(48) 8

(49) 103

***(50) 5,187 — 5,732**

(51) 14

(52) 3

(53) 27

(54) 24

(55) 5

(56) 1

(57) — 7

(58) $9\frac{1}{17}$

(58) 69,015

***(60) 31,130 — 34,406**

(61) — .5, — $\frac{1}{2}$

(62) 10000001101

(63) 13

(64) 5

(65) 36

(66) $\frac{17}{28}$

(67) 24

(68) 8

(69) 1.5, $\frac{3}{2}$, $1\frac{1}{2}$

***(70) 6,877 — 7,600**

(71) 0

(72) 5

(73) 3.6, $\frac{18}{5}$, $3\frac{3}{5}$

(74) — 6

(75) 4

(76) 496

(77) $\frac{51}{154}$

(78) 18

(79) 7

***(80) 141 — 154**

University Interscholastic League - Number Sense Answer Key HS ● District 1 ● 2015

***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) 2,338

(2) 1,687

(3) 420

(4) $671\frac{2}{3}$

(5) 784

(6) 6.4

(7) $23\frac{13}{15}$

(8) .75, $\frac{3}{4}$

(9) 285

***(10) 34,120 — 37,710**

(11) $-3\frac{37}{60}$

(12) 9

(13) 6

(14) 2,777

(15) 1,275

(16) $8\frac{9}{14}$

(17) 2,197

(18) — 97

(19) 1,722

***(20) 1,713 — 1,893**

(21) $47\frac{2}{3}$

(22) 6

(23) 18

(24) 5,290

(25) 6

(26) $12.00

(27) .9, $\frac{9}{10}$

(28) 2

(29) 25

***(30) 342 — 377**

(31) $2\frac{1}{2}$

(32) 619

(33) 10

(34) $-36.25, -\frac{145}{4}, -36\frac{1}{4}$

(35) 503

(36) 2.236

(37) 8,989

(38) $\frac{10}{3}, 3\frac{1}{3}$

(39) 2120

***(40) 290,894 — 321,514**

(41) $19\frac{8}{25}$

(42) $-\frac{5}{9}$

(43) — 2

(44) $-\frac{5}{3}, -1\frac{2}{3}$

(45) 411

(46) 8

(47) 124

(48) 75

(49) 43

***(50) 4,584 — 5,066**

(51) $\frac{1}{30}$

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

(53) 216

(54) 105,944

(55) 3444

(56) 1

(57) 6

(58) 840

(59) 1

***(60) 260 — 287**

(61) $\frac{5}{14}$

(62) 3

(63) $\frac{35}{55}$

(64) 12

(65) 216

(66) 5

(67) 21

(68) 3

(69) 25

***(70) 447,857 — 494,999**

(71) 3,125

(72) 2.5, $\frac{5}{2}, 2\frac{1}{2}$

(73) 16

(74) 729

(75) 0

(76) — 10

(77) 2

(78) 26

(79) 90

***(80) 192 — 212**

University Interscholastic League - Number Sense Answer Key HS ● District 2 ● 2015

***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) 6,626

(2) 938

(3) 68.4

(4) $377\frac{3}{4}$

(5) .00375

(6) $\frac{4}{11}$

(7) $6\frac{11}{30}$

(8) $-\frac{56}{3}, -18\frac{2}{3}$

(9) 256

***(10) 77,206 — 85,332**

(11) 280

(12) 8

(13) $4\frac{17}{20}$

(14) 287

(15) — 100

(16) 19

(17) 690

(18) 2,626

(19) $23\frac{16}{31}$

***(20) 296 — 326**

(21) 10,890

(22) 5

(23) $28\frac{2}{5}$

(24) 203

(25) $54.00

(26) 6

(27) 49

(28) $\frac{19}{45}$

(29) 40

***(30) 283 — 312**

(31) $\frac{13}{3}, 4\frac{1}{3}$

(32) — 340

(33) 35

(34) 2563

(35) 32

(36) 19

(37) 255

(38) $2\frac{1}{2}$

(39) 3.9

***(40) 738 — 814**

(41) 12

(42) 336

(43) 20

(44) — 9

(45) — 5

(46) $-\frac{5}{3}, -1\frac{2}{3}$

(47) — 190

(48) $11\frac{9}{10}$

(49) 84

***(50) 107,443 — 118,752**

(51) 9

(52) 166,866

(53) 0

(54) 6

(55) 720

(56) 49

(57) 129

(58) 2131

(59) — 2

***(60) 846 — 934**

(61) — .5, $-\frac{1}{2}$

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

(63) 0

(64) 8

(65) $\frac{9}{11}$

(66) 20

(67) 15

(68) .75, $\frac{3}{4}$

(69) 2

***(70) 2,860 — 3,160**

(71) — 1,000

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

(73) .5, $\frac{1}{2}$

(74) .75, $\frac{3}{4}$

(75) 5

(76) — 6

(77) 56

(78) 6

(79) — 1,016

***(80) 374 — 412**

University Interscholastic League - Number Sense Answer Key HS ● Regional ● 2015

***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) 1,590

(2) 515.44

(3) 3,720

(4) 6.16

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

(6) 0

(7) $1\frac{1}{10}$

(8) $-.8, -\frac{4}{5}$

(9) 529

***(10) 7,663 — 8,469**

(11) $\frac{1}{11}$

(12) 160

(13) 3,478

(14) 312

(15) 2,815

(16) $8\frac{13}{20}$

(17) 5,136

(18) $18.36

(19) 2,744

***(20) 346,564 — 383,043**

(21) 3

(22) 5,290

(23) $1\frac{1}{4}$

(24) 1,118

(25) 14

(26) — 12

(27) 169

(28) $\frac{19}{21}$

(29) $\frac{13}{45}$

***(30) 737 — 814**

(31) — 72

(32) 464

(33) 70

(34) $11\frac{1}{4}$

(35) 6

(36) $20\ ^{18}/_{29}$

(37) 2.6

(38) 88

(39) 13

***(40) 2,146 — 2,371**

(41) 1.25, $\frac{5}{4}$, $1\frac{1}{4}$

(42) — 4

(43) 7.8125, $\frac{125}{16}$, $7\frac{13}{16}$

(44) 96

(45) 27

(46) 24

(47) 4232

(48) 1

(49) — 8

***(50) 4,474 — 4,944**

(51) 30

(52) $\frac{10}{9}$, $1\frac{1}{9}$

(53) 2,525

(54) 480

(55) $\frac{1}{9}$

(56) 26

(57) 25

(58) 60

(59) 104,975

***(60) 776 — 857**

(61) $\frac{5}{7}$

(62) — 3

(63) — 15

(64) 2

(65) $\frac{65}{70}$

(66) 160

(67) 11

(68) 3

(69) 1.5, $\frac{3}{2}$, $1\frac{1}{2}$

***(70) 342,000 — 377,999**

(71) 225

(72) 27

(73) 11

(74) 3

(75) — 6

(76) 56

(77) 3,925

(78) — 36

(79) 360

***(80) 502 — 554**

University Interscholastic League - Number Sense Answer Key HS ● State ● 2015

***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) 2,541

(2) 296

(3) 390

(4) 4.03

(5) $11\frac{1}{9}$

(6) 676

(7) $\frac{5}{12}$

(8) 2.5, $\frac{5}{2}$, $2\frac{1}{2}$

(9) $23\frac{1}{30}$

***(10) 100,164 — 110,706**

(11) 24

(12) 1,666

(13) 1,350

(14) 301

(15) .9, $\frac{9}{10}$

(16) 210

(17) 16.5, $\frac{33}{2}$, $16\frac{1}{2}$

(18) 1,035

(19) 2,197

***(20) 32,300 — 35,698**

(21) 5

(22) $21.25

(23) $4\frac{7}{12}$

(24) 4101

(25) 6

(26) 6,760

(27) $\frac{4}{15}$

(28) .65, $\frac{13}{20}$

(29) 480

***(30) 2,376 — 2,626**

(31) 51

(32) 120

(33) 20

(34) $1\frac{1}{4}$

(35) 31

(36) 10

(37) 125

(38) 2,197

(39) 4.2, $\frac{21}{5}$, $4\frac{1}{5}$

***(40) 2,672 — 2,953**

(41) $9\frac{1}{17}$

(42) 2

(43) $\frac{4}{33}$

(44) 34

(45) 2

(46) — $\frac{10}{7}$, — $1\frac{3}{7}$

(47) — 3

(48) — 2,280

(49) 30

***(50) 204,841 — 226,403**

(51) 3

(52) 112

(53) 1034

(54) 285

(55) 8

(56) .015625, $\frac{1}{64}$

(57) 625

(58) 113,090

(59) .25, $\frac{1}{4}$

***(60) 228,454 — 252,500**

(61) 18

(62) — 1.5, — $\frac{3}{2}$, — $1\frac{1}{2}$

(63) 3

(64) 1,060

(65) 7

(66) 1,350

(67) $\frac{35}{70}$ (not reducible)

(68) — 2

(69) 2

***(70) 2,018 — 2,229**

(71) $\frac{9}{10}$

(72) .25, $\frac{1}{4}$

(73) 10

(74) 2,060

(75) 2

(76) 5,262,015

(77) 6

(78) 81

(79) 7583

***(80) 2,494 — 2,756**