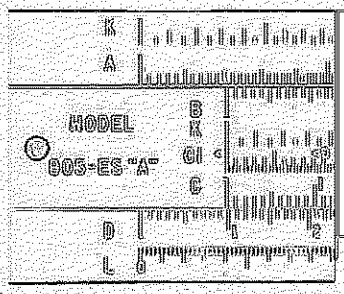
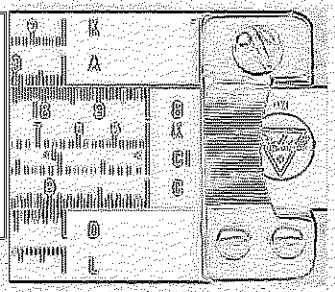
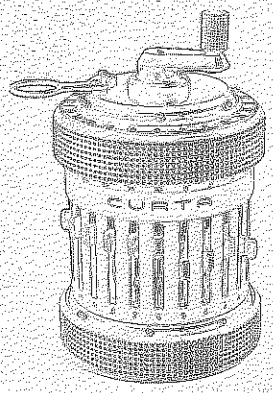
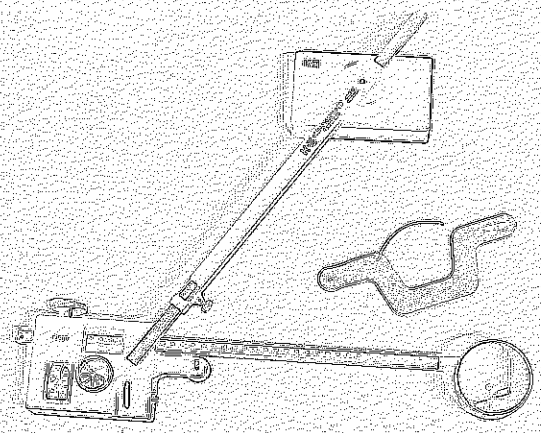


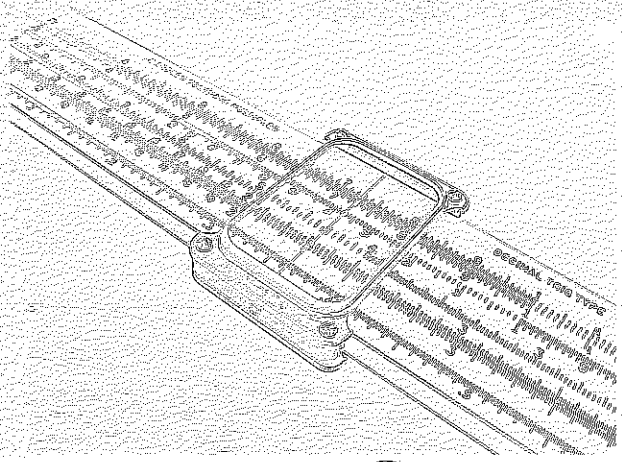
Texas Competitive Mathematics
Web - http://www.texasmath.org
Fax - (206) 666-MATH/(206) 666-6284
E-Mail - webmaster@texasmath.org

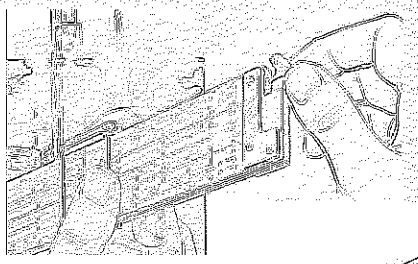


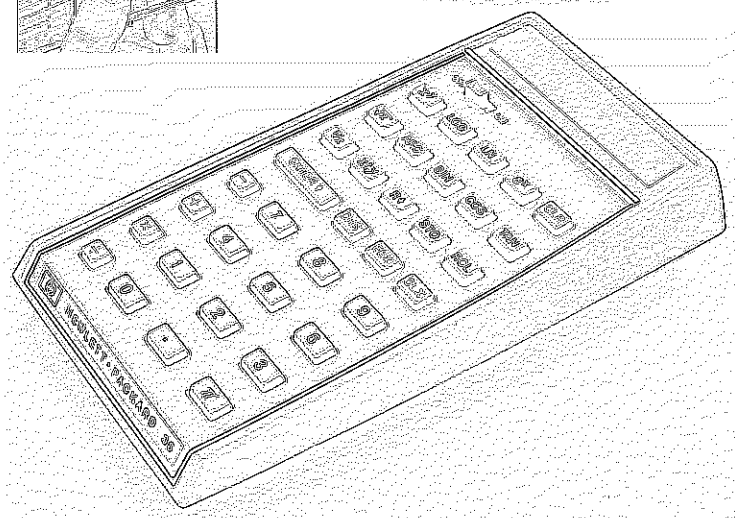
1978-79 UIL Number Sense
(16 pages)

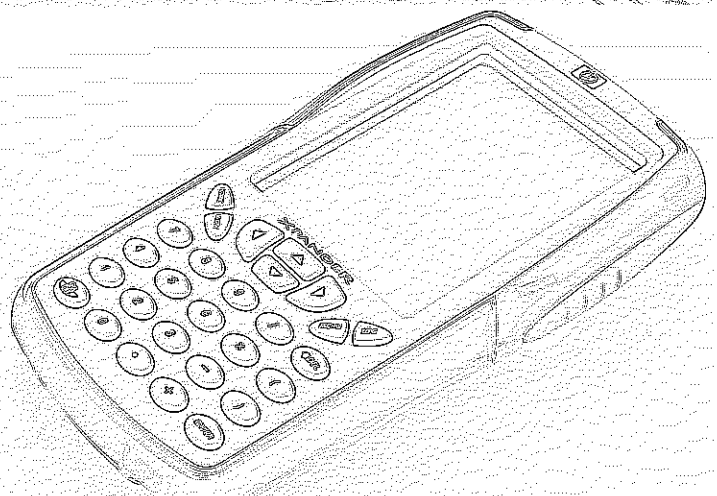


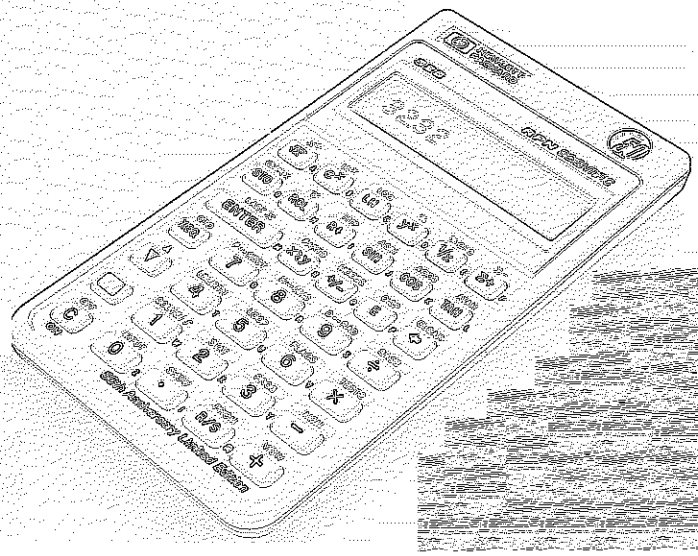


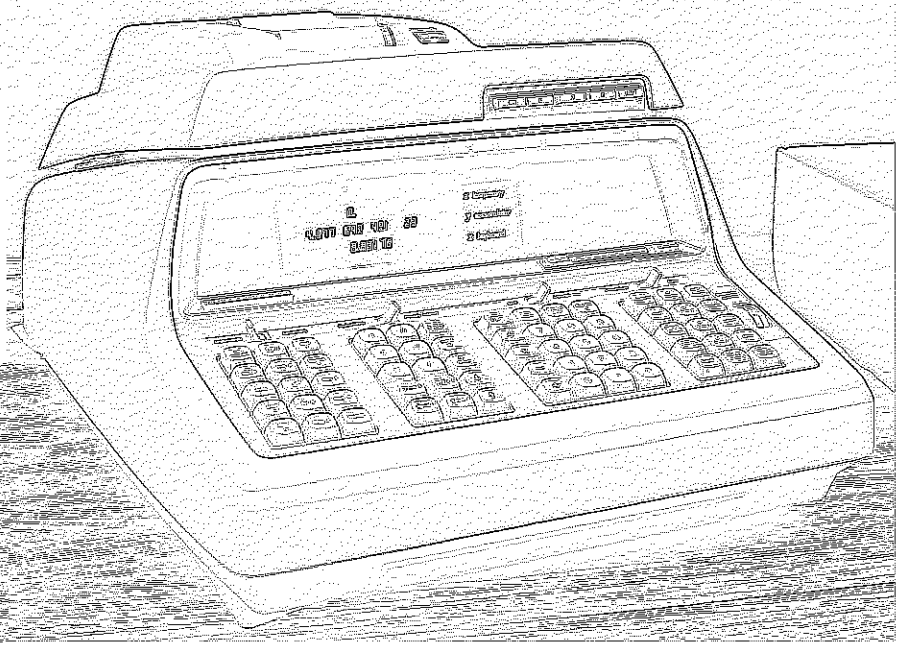












The University of Texas Interscholastic League

Number Sense Test, Series LL-A

Contestant's Number..... Contestant's Score.....

Read Directions Carefully Before Beginning Test

Do Not Unfold This Test Until Told to Begin

Directions: Do not turn this page until person conducting this test gives the signal to begin. This is a ten-minute test. There are 70 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 star (*) require only approximate answers; any answer to a starred problem that is within five per cent of the exact answer will be scored correct; all other problems require exact answers.

Person conducting contest should explain these directions carefully to the contestants.

Stop—Wait for Signal

(1) $28914 + 78099 =$ .....

(2) $30021 - 7487 =$ .....

(3) $27 + 17 + 37 + 41 =$ .....

(4) $3^5 =$ .....

(5) $917 \times 8 =$ .....

(6) $2/9 + 3/7 - 1/3 =$ .....

(7) If Mary went to town and bought a skirt for $19.50, a blouse for $10.75, and a pair of shoes for $17.85, how much change would she receive if she gave the clerk $50.00? $.....

(8) The 5% sales tax on a coat is $17.50. What is the price of the coat, including the sales tax? $.....

(9) $467 \times 11 =$ .....

*(10) $58024 + (174)^2 =$ .....

(11) Circle A has radius $3\frac{1}{2}$ and circle B has radius $10\frac{1}{2}$. Find the ratio of the area of circle A to the circumference of circle B. .....

.....

(12) All of the 185 books in this collection have either short stories or poems in them. If there are 98 books of short stories and 55 of the books have both poems and short stories, how many are books of poems? .....

.....

(13) If one inch equals 2.5 centimeters, 8 ft. = ... cm.

(14) The largest of 7/27, 0.26, and 8/29 is .....

(15) $9.7 + 23\% - 0.15 =$ .....

(16) The largest of any two primes whose sum is 80 is .....

(17) If the sum of five consecutive even numbers is 70, the smallest of these is .....

(18) $\sqrt{1369} =$ .....

(19) If $\frac{9n}{4} - 5 = 3n$, $n =$ .....

*(20) $5899 \times 317 - 3 =$ .....

(21) $79\frac{1}{10}$ is what percent more than 70? .....%.

(22) The average of $170\frac{1}{2}$, $69\frac{3}{4}$, and 77 is .....

(23) $13923 \div 221 =$ .....

(24) Change 2102, base three, to base ten. ....., base ten.

(25) John bought a bat, a ball, and a yo-yo for $4.50. The cost of the ball was 1/6 the cost of the bat; the cost of the yo-yo was 1/2 of the cost of the ball. What did the yo-yo cost? $.....

(26) A $3.15 bag of grass seed will plant 80 square rods. How much will it cost to plant $1\frac{1}{2}$ acres? $.....

(27) Sue buys a tree 5 inches tall. It will grow $1\frac{1}{2}$ inches per month. How tall will the tree be in 6 years? .....ft.

(28) 7 (mod 9) $\div$ 4 (mod 9) = ... (mod 9).

(29) The negative reciprocal of $3\frac{7}{8}$ is .....

*(30) $\sqrt{960400} =$ .....

(31) The remainder when $(12)^4$ is divided by 7 is .....

(32) If $\frac{9^x}{3^{5x}} = 243$, $x =$ .....

(33) Find z: $3y - 3x = 5$
$3y + z = 3$
$3x - z = 0$; $z =$ .....

(34) The greatest common divisor of 120, 90, and 105 is .....

(35) The least common multiple of 120, 90, and 105 is .....

(36) If Dick gives Sam five of his marbles they will have the same number of marbles. But Sam gives five of his marbles to Dick and now Dick has twice as many as Sam. How many marbles did Sam have?

.....

(37) The diameter of a sphere is 12. Find the ratio of the volume of the sphere to the area of the sphere. .....

(38) Find the smallest value of x such that $|3x - 5| \leq 7$. .....

(39) 105, base seven, minus 46, base seven = ..., base seven.

*(40) $36432 \div 55.2 =$ .....

(41) Determine k so that the product of the roots of $\frac{5x^2}{3} - \frac{2x}{5} + k = 0$ is $-\frac{3}{10}$. .....

(42) The remainder when 23081 is divided by eleven is .....

(43) How many different ways can twelve books be arranged on a shelf if the shelf will hold only three books at a time? .....

(44) The slope of the line perpendicular to $\frac{7x}{4} + \frac{5y}{8} = \frac{1}{2}$ is .....

(45) How many different 6-element subsets can be constructed from a set of 10 elements? .....

(46) Write $1.0\overline{63}$ as a common fraction. .....

(47) $(65)^2 =$ .....

(48) The median of $128\frac{1}{2}$, $119\frac{3}{4}$, $150\frac{1}{2}$, and $134\frac{2}{3}$ is .....

(49) Two dice are tossed. Find the probability that the sum of the faces is 8 or 5. .....

*(50) 185 pecks = ... pts.

(51) The distance between the points $(\frac{1}{2}, 2)$ and $(3, \frac{1}{4})$ is in simplified form $a\sqrt{b}$ and $b =$ .....

(52) The number of terms in the expansion of $[(5x - 6y)^3 (5x + 6y)^3]^3$ is .....

(53) Hank buys a house for $35,000.00. He pays $5,000.00 down and signs a note for the balance. He pays nothing for six years. He then pays the balance of the note and 8% simple interest. What is the cost of Hank's house? $.....

(54) $\log_6[216^3 \sqrt[3]{(36)^2}\,(36)^{-2/3}] =$ .....

(55) Find the smallest value of x such that $\frac{2x^2}{3} - 7x + 15 = 0$. .....

.....

(56) Two cards are dealt from a deck. Find the odds that both cards are Jacks. .....

(57) If $f(x,y) = (3x)^y - (y)^{2x}$, $f(2, -1) =$ .....

(58) $7.26 \div 1.32 =$ .....

(59) Change 637, base eight, to base four. ....., base four.

*(60) The cost of 1582 acres at $2950.00 per acre = $ .....

(61) The midpoint of the line segment with endpoints $(\frac{1}{2}, -6)$ and $(3, \frac{2}{3})$ is .....(.....,.....)

(62) If $f(x) = 3x^2 - 2x^3 + 4x + k$, determine k so that $f(x)$ is divisible by $x - 2$. .....

(63) The vertex of the parabola $y = 2x^2 - 6x + 4$ is (.....,.....).

(64) If $(x, -1)$ lies on the same line containing the points $(2, 0)$ and $(-1, 3)$, then $x =$ .....

(65) On a number sense test, Jane worked 74 problems. She was given five points for each problem worked correctly and three points was subtracted for each problem she worked incorrectly. Her score was 90. How many problems did she solve correctly? .....

(66) $\int_{-3}^{2} 6x^2\,dx =$ .....

(67) If $x = 3 - i$, $x^2 - 6x =$ .....

(68) If $A = \begin{bmatrix} \frac{2}{3} & -1 \\ 4 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 6 \\ -5 \end{bmatrix}$ $AB = \begin{bmatrix} \quad \end{bmatrix}$.

(69) The second derivative of $f(x) = \frac{x^{-2}}{12} + 3x^2$ is .....

*(70) $(38)^3 + (2)^3 =$ .....

The University of Texas Interscholastic League

Number Sense Test, Series LL-B

Contestant's Number..... Contestant's Score.....

Read Directions Carefully Before Beginning Test

Do Not Unfold This Sheet Until Told to Begin

Directions: Do not turn this page until person conducting this test gives the signal to begin. This is a ten-minute test. There are 70 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 star (*) require only approximate answers; any answer to a starred problem that is within five per cent of the exact answer will be scored correct; all other problems require exact answers.

Person conducting contest should explain these directions carefully to the contestants.

Stop—Wait for Signal

(1) 71803 + 9749 = ...

(2) 30710 — 6928 = ...

(3) 9½ — 7 6/11 = ...

(4) 6⅝ × 9⅜ = ...

(5) 44 is what percent less than 176? ..... %.

(6) Sue buys a notebook for $3.98, two packages of paper at $.89 per package, and two pens priced at 6 for $.84. How much does she spend? $.....

(7) $(53)^2$ = ...

(8) What is the largest possible integer whose square is less than 280? .....

(9) Six more than five times a certain number is twenty-one. The number is .....

*(10) 57162 + 80138 + 940 = ...

(11) The area of a triangle whose base is 6½ and whose height is 26 is .....

(12) $\sqrt{4356}$ = ...

(13) If one inch equals 2.5 centimeters, 6 yards = ... cm.

(14) If 3 3/7 is to 80 as x is to 6⅝, find x. .....

(15) 655 × 11 = ...

(16) 11 2/7 — 4 1/3 + 1 1/9 = ...

(17) Bob needs $21,000.00 at the end of 8 years. How much will he have to invest now at 5% simple interest in order to have it? .....

(18) The largest of 9/14, 11/16 and .64 is .....

(19) 17 × 24 + 34 × 18 = ...

*(20) 772 × 955 = ...

(21) Joe can do a piece of work in 12 days. Hank is 50% faster than Joe. How long will it take Hank to do the same piece of work? ..... days.

(22) The greatest common divisor of 66, 54 and 72 is .....

(23) The least common multiple of 66, 54 and 72 is .....

(24) Change 156, base ten, to base five. ....., base five.

(25) The sum of the distinct prime divisors of 480 is .....

(26) A car can travel 22 miles on a gallon of gasoline. At the cost of $.51½ per gallon how much will it cost to travel 880 miles? $.....

(27) The average of 130½, 149, and 162¼ is .....

(28) Jim had to purchase the drinks for a party. There will be 32 girls, 34 boys and 14 teachers there. Jim is to provide 8 ounces of kool-aid for each person there. How many gallons should he buy? ..... gallons.

(29) 20280 ÷ 312 = ...

*(30) $\sqrt{636804}$ + 2 = ...

(31) The remainder when $(13)^5$ is divided by 9 is .....

(32) Find the volume of a pyramid if the area of the base is 44½ and its height is 24. .....

(33) Solve for y: $3x + z = 1$
$z - y = 4$
$6x - y = -3$: y = ...

(34) In a class of 54 students all of them like Coke or Sprite. 28 like Coke, and 15 like both Coke and Sprite. How many like Sprite?

.....

(35) Two dice are tossed. What is the probability that the difference of the faces will be four or that one of the faces will be a six? .....

.....

(36) The smallest value of x such that $\left| \frac{2x}{5} - 3 \right| = 1$ is .....

(37) The x-intercept of the line containing the points (1, −1) and (0, 2) is .....

(38) Write $2.0\overline{69}$ as a common fraction. .....

(39) If $f(x) = 2x - (3)^{2x-1}$, f(2) = ...

*(40) $15 \times 20 \times 40 \times 35$ = ...

(41) A truck travels up a hill at 20 miles per hour. He travels the same distance down the hill at 30 miles per hour. What is his average speed? ..... mph.

(42) $\log_7 \frac{(49)(343)}{7^{-2}} - 4 \log_7 7$ = ...

(43) Determine k so that the sum of the roots of $\frac{5x^2}{3} + kx = 3$ is ⅓.

.....

(44) 243, base six, multiplied by 4, base six = ..., base six.

(45) The radius of a circle is increased by 50%. Its circumference will be increased by what %? .....%.

(46) How many different three-element subsets can be constructed from a set containing 17 elements? .....

(47) If 1 km equals 0.6 miles, 33⅓ km = ... yards.

(48) If 189 is divided into three parts proportional to 7, 9 and 11, the largest part is .....

(49) While grocery shopping, you purchase the following: 2 loaves of bread at $.49 each, 3 pounds of meat at $1.30 a pound, and 3 pounds of potatoes at $.20 a pound. How much change would you receive from $10.00? $ .....

*(50) $(58806 \div 891) \times 265 + 10$ = ...

(51) If repetition of digits is not permitted, how many different three-digit numbers can be constructed using "8, 7, 3, 4, 5, 6, 2, 9"?

.....

(52) Find the largest value of x in the solution set for $x^2 - 4xy = 1$ and $x + y = 1$. .....

(53) If x and y vary indirectly and x = ⅔ when y = 5, find x when y = 1⅓. .....

(54) The vertical asymptote for $f(x) = \frac{3x-4}{2x+7}$ is x = ...

(55) Two dice are tossed. What are the odds that the difference of the faces will be four? .....

(56) The sum of the infinite geometric series ⅜ + ⅛ + 8/27 + 64/243 + . . . = ...

(57) The vertex of the parabola $f(x) = x^2/2 - 5x + 1$ is (.....,.....).

(58) The median of 113¼, 127⅛, 120½ and 129¼ is .....

(59) If $f(x,y) = 3xy - (2y)^x$, f(2, −1) = ...

*(60) The volume of a pyramid with base 69 and height 380 = ...

.....

(61) A rancher sells eight calves that weigh 450 pounds each. He sells them for $45.00 per hundred but must pay a commission of 2%. How much will he receive? $.....

(62) $(1 - 2i)^3 = a + bi$ and b = ...

(63) The second derivative of $f(x) = 3x - \frac{x^{-2}}{4}$ is .....

(64) Sin $(\arccos \frac{\sqrt{3}}{2}) + \tan \frac{3\pi}{4}$ = ... (Use smallest positive angle).

(65) $\sum_{x=1}^{4} \left(\frac{2x}{3} - 2 \right)$ = ...

(66) If $A = \begin{bmatrix} 3 \\ -1 \\ 2 \end{bmatrix}$, $B = \begin{bmatrix} 1 \\ 2 \\ ½ \end{bmatrix}$, 2B − 3A = $\begin{bmatrix} \quad \end{bmatrix}$.

(67) When $f(x) = \frac{5x^2}{2} - 3x + 4x^3$ is divided by (x + 2) the remainder is .....

(68) $\int_3^5 6x^2 dx$ = ...

(69) Change 0.76, base ten, to base five. ....., base five.

*(70) If 1 km = .6 mile, 50 sq. km = ... acres.

The University of Texas Interscholastic League

Number Sense Test, Series LL-C

Contestant's Number..... Contestant's Score.....

Read Directions Carefully Before Beginning Test

Do Not Unfold This Sheet Until Told to Begin .

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Stop—Wait for Signal

(1) $2109 + 6544 + 806 =$ .....

(2) $34401 - 7528 =$ .....

(3) $6\ 5/9 - 4\ 3/5 =$ .....

(4) If $\frac{6n}{7} - 6 = 3n$, $n =$ .....

(5) $681 \times 9 =$ .....

(6) $(305)^2 =$ .....

(7) $2773 \div 47 =$ .....

(8) $9\ 9/25 \div 7\ 1/5 =$ .....

(9) If a car can travel 23½ miles on a gallon of fuel, how many gallons will it require to travel 940 miles? ..... gal.

*(10) $72084 + 9986 - 3842 - 8 =$ .....

(11) $6\frac{2}{3} + 1\frac{1}{2} + 7\frac{1}{4} - 4\frac{1}{2} + 5\frac{1}{3} =$ .....

(12) $483 \times 11 =$ .....

(13) A building must contain 3486 sq. ft. If it is 83 ft. long, how wide must it be? ..... ft.

(14) If it takes 8 minutes to travel 12 miles, what is the speed? ..... mph.

(15) If a 6 oz. meat stick sells for 39¢, find the selling price per pound. $ .....

(16) $\sqrt{5329} =$ .....

(17) Find the base of a triangle of area 371 sq. in. and altitude 15 1/7 in. ..... in.

(18) Find the cost of 18 gallons of fuel at 49½¢ per gallon. $.....

(19) 586½ is what percent less than 690? .....%.

*(20) $577 \times 933 - 1 =$ .....

(21) Change 156, base ten, to base eight. ....., base eight.

(22) The sum of three consecutive even numbers is 72, and the largest is .....

(23) Mary went grocery shopping. She bought 3 loaves of bread at 43¢ per loaf, 2 bags of potato chips at 79¢ per bag, and 12 oz. of lunch meat at $1.28 per pound. How much change did she receive from $5.00 after she paid for her groceries? $.....

(24) $(9\frac{1}{2} \times 9\frac{1}{2}) - (4\frac{1}{2} \times 4\frac{1}{2}) =$ .....

(25) The average of 14½, 26¼, and 51½ is .....

(26) The interest rate of 1¾% per month is equivalent to what annual rate? .....%.

(27) The center of the circle $3x^2 - 6x + 3y^2 + y = 64$ is (.....,.....).

(28) The sum of the distinct prime divisors of 627 is .....

(29) The negative reciprocal of $-\ 7\ 8/9$ is .....

*(30) $379240 \div 499 =$ .....

(31) There are 32 members in a club. How many different 3-member committees can be formed? .....

(32) There are 120 students in a class. 76 are taking English, 84 are taking Math, and 49 are taking both English and Math. How many of the students in this class are not taking English or Math? .....

(33) The greatest common divisor of 98, 63 and 56 is .....

(34) The least common multiple of 98, 63 and 56 is .....

(35) The remainder when 308174 is divided by 9 is .....

(36) $4 \pmod{11} \times 9 \pmod{11} =$ ..... $\pmod{11}$.

(37) An item is priced for sale at \$312.00. This is 30% above cost. What was the cost of the item? \$.....

(38) The largest value of x such that $|5 - 3x/2| \leq 7$ is .....

(39) Solve for x: $x - 2y = 1$
$4y + z = 1$
$x + z = 3$; $x =$ .....

*(40) 60 cu. ft. = ... cu. in.

(41) Bill stuck his pocket knife into the ground. Then he walked 3000 yards North, 4000 yards East and 6000 yards South. How far is he from his pocket knife? ..... yds.

(42) The volume of a cube is 512. Its surface area is .....

(43) The distance from $(-3, 0)$ to $(\frac{1}{3}, \sqrt{\frac{7}{3}})$ is .....

(44) If $f(x) = \frac{5x^3}{2} + 3x^2 + 7$, $f(-2) =$ .....

(45) 25, base six, multiplied by 5, base six, = ..., base six.

(46) The x-intercept of the line containing the points $(1, -2)$ and $(3, 0)$ is .....

(47) Determine k so that the product of the roots of $f(x) = \frac{5x^2}{3} - \frac{2x}{5} + k$ is -6. .....

(48) The number of permutations of 20 elements taken 3 at a time is .....

(49) A checking account contains \$712.60. If checks are cashed for \$47.50 and \$189.72, how much remains in the account? \$.....

*(50) $(57)^3 + 7 =$ .....

(51) Three coins are tossed. What is the probability that at least two heads appear? .....

(52) $3.424 \div 10.7 =$ .....

(53) $\left[\sin\frac{3\pi}{4} - \cos\frac{7\pi}{6}\right]^2 = a + b\sqrt{c}$ and $a =$ .....

(54) $\log_4 16 - 8 \log_4 \frac{1}{2} =$ .....

(55) The radius of the circle $5x^2 + 10x + 5y^2 = 400$ is .....

(56) A line, l_1, contains the points $(-\frac{1}{3}, -1)$ and $(2, 2)$. l_2 is a line perpendicular to l_1. The slope of l_2 is .....

(57) If $g(x) = 3x^2 - \frac{5x}{2}$ and $f(x) = 4 - 3x$, $f[g(2)] =$ .....

(58) The vertex of $f(x) = 4x^2 - 3x + 1$ is (.....,.....).

(59) If $f(x,y) = x^{2y-x} + y^{3x}$, $f(2,-1) =$ .....

*(60) $\lim_{x \to 16} \left[\frac{x^5 - 6x^2 + 4}{x}\right] - \frac{1}{4} =$ .....

(61) The remainder when $f(x) = 3x^2 - 6x + 2$ is divided by $(x - \frac{1}{2})$ is .....

(62) The sum of the infinite geometric series $4/3 + 1/6 + 1/48 + 1/384 + \ldots$ is .....

(63) If $f(x) = \frac{3x^3 - 3x^2 + 1}{x}$, $f(i) = a + bi$ and $b =$ .....

(64) The slope of the line tangent to $f(x) = 5x^3 - \frac{3x^2}{2} + 1$ at $x = \frac{1}{3}$ is .....

(65) $\sum_{i=1}^{6} (5i - 3) =$ .....

(66) The second derivative of $f(x) = \frac{3x^2}{2} - \frac{x^3}{12}$ is .....

(67) If $A = \left[\frac{1}{2}, \frac{3}{4}\right]$ and $B = \begin{bmatrix} 4 \\ -12 \end{bmatrix}$, $AB = \begin{bmatrix} \quad \end{bmatrix}$.

(68) Two dice are tossed. What are the odds that the sum of the faces will be eight? .....

(69) The sum of the coefficients of all the terms in the expansion of $\left(\frac{x}{3} - \frac{2y^2}{3}\right)^5$ is .....

*(70) $55 \times 144 + 33 \times 65 + 7 \times 5 =$ .....

The University of Texas Interscholastic League

Number Sense Test, Series LL-1

Contestant's Number_____ Contestant's Score_____

Read Directions Carefully Before Beginning Test

Do not Unfold This Sheet Until Told to Begin

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Stop—Wait for Signal

(1) 35862 + 58934 = _____ .

(2) 252103 − 72915 = _____ .

(3) 8 × 745 = _____ .

(4) 7654 ÷ 43 = _____ .

(5) 3 1/7 − 2 3/8 = _____ .

(6) $(405)^2$ = _____ .

(7) If five less than seven times a certain number is thirty, the number is _____

(8) 976 − 431 + 29 = _____ .

(9) 2 9/14 ÷ 9 1/4 = _____ .

*(10) 892176 + 43109 + 715 = _____ .

(11) 24 is what percent of 150? _____ %.

(12) $\sqrt{9801}$ = _____ .

(13) If a person works 8 1/2 hours a day, five days a week and is paid four dollars per hour and time and a half for any hours he works over forty hours per week, what is the gross salary for one week? $_____

(14) 9 1/2 is to 60 as 3 4/5 is to _____ .

(15) Find the interest on $380 for one year at 7 3/4%. $_____

(16) The area of a parallelogram of base 14 and altitude 17 is _____

(17) 5 1/2 + 6 3/4 + 2 3/4 + 11 1/4 + 4 3/4 = _____

(18) The average of 124, 65, and 87 is _____ .

(19) If 6n − 73 = 137, n = _____ .

*(20) 594 × 770 = _____ .

(21) 2400 square rods = _____ acres.

(22) 16 1/2 × 44 = _____ .

(23) Find the cost of 18 gallons of gasoline at 49 1/2¢ a gallon. $_____

(24) The circumference of a circle with radius 5 1/4 is _____ (use pi = 22/7).

(25) 647 × 11 = _____ .

(26) If the sum of four consecutive even numbers is 60, the largest is _____

(27) Change 134, base ten, to base seven. _____, base seven.

(28) 84 + 93 × 8 = _____ .

(29) A stove is priced at $300.00 less successive discounts of 15% and 20%. What is the sale price of the stove? $_____

*(30) 576400 ÷ 655 = _____ .

(31) The greatest common divisor of 126, 99, and 154 is _____

(32) The least common multiple of 126, 99, and 154 is _____

(33) The radii of two circles are 10 and 14, respectively. The ratio of the circumference of the smaller to the circumference of the larger circle is _____ .

(34) The median of 97, 146, 192, 128 is _____

(35) If $f(x) = \frac{x^2}{2} - 4|3 - x| + 3$. f(4) = _____ .

(36) The number of distinct prime divisors of 462 is _____

(37) The smaller of 7/17 and 0.47 is _____ .

(38) If one centimeter equals 0.39 inches, 6 meters = _____ inches.

(39) 39, base thirteen, added to 56, base thirteen = _____, base thirteen.

*(40) $(57)^2 + (89)^3 - 3^2 \times 2$ = _____ .

(41) John buys meat at three pounds for $2.90 and he sells it at five pounds for $6.75. How much will he make if he sells forty-five pounds of meat? $_____

(42) Solve for y: $2x + y = 3$

$y - z = 1$

$z + 4x = 5$, y = _____

(43) The distance between the points (4, 2) and (−2, 4) is $a\sqrt{b}$ and b = _____ .

(44) 2 1/2 × 64 1/2 = _____ .

(45) The area of a triangle whose base is 12 and whose height is 17 is _____

(46) 13 2/5 is what percent more than 8? _____%.

(47) If a/29 has a remainder of 12 and b/29 has a remainder of 14, then ab/29 has a remainder of _____

(48) $629 \times 111 =$ _____ .

(49) All the residents of Podunk either own a home or a car. Two-thirds of the 960 residents own a home and three-fourths of the residents own a car. How many of the residents of Podunk own both a home and a car? _____

*(50) $\lim_{x \to 25} \frac{3x^4 - x^3 - 10x}{x} =$ _____ .

(51) If $5^{x-1} = x$, $x =$ _____ .

(52) Solve for x: $2x^2 + 6x + 5y + 7 = 0$

$2x + y + 1 = 0$

$x > 0$, $x =$ _____ .

(53) The remainder when 8962 is divided by eleven is _____

(54) The smallest number of any two prime numbers whose sum is 48 is _____ .

(55) If 90 is divided into three parts proportional to 4, 8, and 12, the largest part is _____ .

(56) Write the value of $0.\overline{729}$ as a common fraction. _____

(57) Find the slope of the line $\frac{2x}{5} - \frac{3y}{10} = 1/2$. _____

(58) How many different subsets that contain 10 elements can be selected from a set of 13 elements?. ____ .

(59) $\log_4 [(16^{2/3})(\sqrt{32})(64^{-1/2})] =$ _____ .

*(60) $70 \times 71 \times 81 \times 90 =$ _____ .

(61) $(53_{\text{fourteen}}) \times (6_{\text{fourteen}}) =$ _____ , base fourteen.

(62) A line joins the points (3, −1) and (−2, 9). Its y-intercept is _____

(63) How far can you travel in one hour and twenty minutes at 57 miles an hour? _____ miles.

(64) The Arabic numeral for CMXCIX is _____ .

(65) How many planes are determined by seven points, no four of which are in the same plane? _____ .

(66) The product of the roots of $\frac{3x^2}{5} + 2x = 9$ is _____

(67) If 1 gram = .04 oz., 20 pounds = _____ grams.

(68) If two cards are drawn, without replacement, from a deck of 52 cards, what is the probability both cards will be hearts? _____ .

(69) Using the same experiment, what are the odds that both cards drawn will be aces? _____

*(70) $\sum_{x=1}^{10} 4x^3 =$ _____ .

(71) If $f(x) = 5x^3 - 3x^2 + 2x + k$, determine k so that f(x) is divisible by $x + 1$. _____

(72) Change 0.14, base five, to base ten. _____

(73) If $f(x, y) = y + x^{y-x}$, $f(-2, 2) =$ _____ .

(74) 3 (mod 7) ÷ 5 (mod 7) = _____ (mod 7).

(75) If $f(x) = \frac{x^2 - x^4}{x^2 - 1}$, f (i) = _____ .

(76) The second derivative of $f(x) = \frac{5x}{3} - \frac{2x^4}{9}$ is _____

(77) $\lim_{x \to 1} \frac{3x^2 - 4x + 1}{x - 1} =$ _____

(78) $\int_1^2 3x^2 dx =$ _____ .

(79) The coefficient of the a^2b^6 term of the binomial expansion of $(2a - b^2)^6$ is _____ .

*(80) 660 gallons = _____ ounces.

The University of Texas Interscholastic League

Number Sense Test, Series LL-2

Contestant's Number_____ Contestant's Score_____

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Stop—Wait for Signal

(1) $64129 + 94373 =$ _____ .

(2) $371406 - 86738 =$ _____ .

(3) $7 \times 829 =$ _____ .

(4) $9652 \div 38 =$ _____ .

(5) $2/5 + 6/13 =$ _____ .

(6) $16 \times 190 + 54 \times 80 =$ _____ .

(7) $(315)^2 =$ _____ .

(8) $1\ 3/7 \times 4\ 2/3 =$ _____ .

(9) 12 acres = _____ sq. rd.

*(10) $51663 + 80129 - 4996 + 4 =$ _____ .

(11) If a hotel room costs $35.50 per day, how much will it cost to stay in the room for four days? $_____

(12) $1492 - 827 + 164 =$ _____ .

(13) How much money would you have to invest at 7% simple interest so that in ten years you would have $15,300.00? $_____

(14) If $7n - 56 = 91$, $n =$ _____ .

(15) $742 \times 11 =$ _____ .

(16) The average of 81, 65, and 34 is _____.

(17) $\sqrt{7744} =$ _____ .

(18) $1\ 1/8 + 4\ 2/3 - 3\ 7/8 =$ _____ .

(19) If a car travels 17 miles on one gallon of fuel, how many gallons are required for a trip of 578 miles? _____ gal.

*(20) $69 \times 188 + 8 =$ _____ .

(21) The area of a triangle of base 19 and altitude 24 is _____.

(22) $1/7 + 9/11 - 1/5 =$ _____ .

(23) If the sum of four consecutive odd numbers is 80, the smallest is _____ .

(24) Change 125, base six, to base ten. _____.

(25) $10\ 1/3 \times 36 - 12 =$ _____ .

(26) 12 1/3 is to 40 as 3 1/12 is to _____ .

(27) A coat is priced at $500.00 less successive discounts of 10% and 25%. What is the sale price of the coat? $_____

(28) $4\ 1/3 + 11\ 1/3 + 5\ 2/3 - 7\ 1/3 =$ _____ .

(29) If a rectangular field is 6 feet by 8 feet and if you walk completely around the field and then walk down one diagonal, how far will you have walked? _____ feet.

*(30) $512440 \div 557 =$ _____ .

(31) The median of 276, 194, 289, 205 is _____.

(32) The least common multiple of 48, 54, and 96 is _____

(33) The greatest common divisor of 48, 54, and 96 is _____

(34) The diameters of two circles are 12 and 16, respectively. The ratio of the area of the smaller to the area of the larger circle is _____ .

(35) If I buy apples at 40 cents a dozen and sell them at 5 for 30 cents, how much will I make if I sell 60 apples? $_____

(36) If $f(x) = 5 + 1/2|4 - 2x| - x^2$, $f(5) =$ _____.

(37) The sum of the distinct prime divisors of 504 is _____

(38) The distance between the points $(1, -3)$ and $(3, 1)$ in simplified form is $a\sqrt{b}$, and a = _____.

(39) The smaller of $8/23$ and 0.348 is _____.

*(40) 120% of 8795 added to 6 is _____.

(41) If one centimeter equals 0.39 inches, 50 decimeters = _____ inches.

(42) 152, base thirteen, minus 96, base thirteen = _____, base thirteen.

(43) Solve for x:

$$2y - x = 3$$
$$x + 2z = 0$$
$$z + 2y = 2, \quad x = \_\_\_\_\_.$$

(44) 1 1/2 is what percent less than 8? _____%

(45) If $\frac{a}{23}$ has a remainder of 15 and $\frac{b}{23}$ has a remainder of 18, then $\frac{ab}{23}$ has a remainder of _____.

(46) 437×111 = _____.

(47) If $f(x) = (2^3)^x$, $f(2)$ = _____.

(48) The remainder when 64825 is divided by nine is _____.

(49) In a basketball game the Dragons made 13 of their 20 foul shots. What percent of their foul shots did they make? _____%.

*(50) If 1 liter = 1.1 qt., 2700 liters = _____ gallons.

(51) Solve for x:

$$3x^2 - x + 4y + 2 = 0$$
$$y - 2x + 1 = 0$$
$$x > 3/2, \quad x = \_\_\_\_\_.$$

(52) If 85 is divided into three parts proportional to 3, 5, and 7, the smallest part is _____.

(53) Write the value of $0.\overline{675}$ as a common fraction. _____.

(54) Find the slope of the line $\frac{5y}{8} + \frac{3x}{4} = 1/6$. _____.

(55) The largest number of any two prime numbers whose sum is 52 is _____.

(56) $(48_{\text{eleven}}) \times (7_{\text{eleven}})$ = _____, base eleven.

(57) The number of permutations of eleven elements taken three at a time is _____.

(58) A line joins the points $(-2, 2)$ and $(1, 8)$. Its y-intercept is _____.

(59) Two cards are drawn, without replacement, from a deck of 52 cards. What is the probability that both cards are red? _____.

*(60) $(44)^3 - (88)^2$ = _____.

(61) $\text{Log}_5 [(25)^{1/3} \sqrt{625} (125)^{-1/2}]$ = _____.

(62) How many planes are determined by eight points, no four of which are in the same plane? _____.

(63) The Arabic numeral for MMCDXCVII is ____.

(64) The sum of the roots of $\frac{7x^2}{4} - 14x = \frac{1}{2}$ is _____

(65) The fourth power of $\sqrt{2 + \sqrt{2 + \sqrt{1}}}$ is $a + b\sqrt{c}$ and a = _____.

(66) If $f(x, y) = 2x - y^{x-y}$, $f(3, -2)$ = _____.

(67) The midpoint of the line segment with endpoints $(2, 6)$ and $(-5, 8)$ is (_____, _____).

(68) If $f(x) = \frac{x^2 + x^4}{2 + x^2}$, $f(i)$ = _____.

(69) If x and y vary directly and $y = 1/3$ when $x = 6$, find y when $x = 8$. y = _____.

*(70) $\sqrt{15054400}$ = _____.

(71) 4 (mod 8) ÷ 3 (mod 8) = _____ (mod 8).

(72) The slope of the line tangent to the curve $y = 2x + 4x^3 + 1$ at $x = -2$ is _____.

(73) Find the smallest positive value of x such that $3 - 2 \tan x = \tan x$. _____.

(74) If $f(x) = 3x - 2x^4 + 5x^2 + k$, determine k so that $f(x)$ is divisible by $x + 2$. _____.

(75) $\sum_{x=1}^{4} (3x - 1)$ = _____.

(76) The number of terms in the expansion of $[(2x-y)^2 (2x + y)^2]^3$ is _____.

(77) Change 0.32, base four, to base ten. _____.

(78) 5 gallons = _____ ounces.

(79) $\int_{-3}^{1} 4x^{-3} dx$ = _____.

*(80) The area of a trapezoid with height 660 and bases 540 and 28 is _____.

The University of Texas Interscholastic League

Number Sense Test, Series LL-3

Contestant's Number_____ Contestant's Score_____

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Stop—Wait for Signal

(1) 81926 + 79468 = _____ .

(2) 10302 − 8615 = _____ .

(3) 11 2/3 − 3 1/2 = _____ .

(4) 847 × 9 = _____ .

(5) 18 × 29 − 9 × 36 = _____ .

(6) 14628 ÷ 53 = _____ .

(7) $\sqrt{4489}$ = _____ .

(8) 6 1/2 + 2 2/3 − 1 3/4 + 3 1/3 + 5 1/4 = _____

(9) 3 5/9 ÷ 10 2/3 = _____ .

*(10) 34061 + 89214 + 6785 = _____ .

(11) If $2x - 3/4 + 1 = \frac{5x}{6} - 2/3$, x = _____ .

(12) If Ann buys limes at $.39 for 1/2 dozen, at the same rate, what will 98 limes cost? $_____

(13) The average of 19 1/2, 8 3/4, and 12 1/4 is _____.

(14) Sue is three times as old as Mary. In eight years Mary will have lived half as long as Sue. How old is Mary? _____

(15) 493 × 111 = _____ .

(16) Write the smallest of 9/14, .64, 66⅔%. _____ .

(17) If Bob solved 17 out of 20 problems correctly, what percent of the problems did he miss? _____ %.

(18) A drugstore ran a special price on hair spray and toothpaste. On a certain day, 66 people bought toothpaste, 37 bought hair spray, and 15 bought both. How many people took advantage of these specials on that day? _____ .

(19) Mary is making ice cream for a party. She uses 28 eggs, 6 gallons of milk, and 4 pounds of sugar. If eggs cost 57¢ a dozen, milk is $1.63 a gallon, and sugar sells for 23¢ a pound, how much did the ice cream cost her? $ _____ .

*(20) 548 × 445 = _____ .

(21) 96 2/3% = _____ (fraction).

(22) The greatest common divisor of 126, 99, and 198 is _____

(23) The least common multiple of 126, 99, and 198 is _____

(24) If one mile equals 1.6 kilometers, 55 miles = _____ kilometers.

(25) Change 164, base ten, to base seven. _____, base seven.

(26) The product of the distinct prime divisors of 342 is _____

(27) The negative reciprocal of −3 21/23 is _____ .

(28) The area of a square is 49 square inches. If each side is increased by 3 inches, what will be the increase in the area? _____ sq. in.

(29) $(74)^2$ = _____ .

*(30) $(72)^3 - (34)^2 + 2^3$ = _____ .

(31) The median of 19 1/2, 27 1/4, 15 3/4 and 23 1/2 is _____

(32) Solve for y:

$2z - x = 2$

$4y + 2x = 0$

$3y - z = 0$, y = _____

(33) If a fur coat is on sale for $1,500.00 less successive discounts of 20% and 25%, what is the sale price of the coat? $ _____ .

(34) 68 × 25 1/2 = _____ .

(35) The circumference of a circle is 14π. What is the area of the circle? _____ (use pi = 22/7)

(36) The remainder when $(11)^6$ is divided by 8 is _____

(37) If the radius of a circle is increased by 100%, the area is increased by what percent? _____%

(38) If three cards are dealt, what is the probability that all three cards are aces? _____

(39) The number of terms in the expansion of $[(3x - 2y)^2 (3x + 2y)^2]^3$ is _____.

*(40) 340 cu. yd. = _____ cu. ft.

(41) A man buys a house for $10,000.00 and rents it. He pays $60.00 of each month's rent for repairs; pays $330.00 a year taxes and realizes 7 1/2% on his investment. What is the monthly rent? $_____.

(42) 1021, base three, minus 202, base three = _____, base three.

(43) If $f(x) = \left|\frac{3x}{2} - 5\right| - \frac{2x^2}{3}$, f(3) = _____ .

(44) The midpoint of the line segment whose endpoints are (1/3, 1) and (−1, 2/3) is _____ .

(45) The sum of the roots of $\frac{4x^2}{5} - \frac{3x}{10} + 1/2 = 0$ is

_____

(46) On a test, one class of 30 students made an average grade of 85%, another class of 20 students made an average grade of 75%. The average grade for all students in both classes is _____%.

(47) Given 14 points in a plane no three are collinear, the number of lines they determine is _____ .

(48) If gasoline sells for 49.8¢ per gallon, 15 gallons will cost $_____.

(49) The distance between the points (1, −3/2) and (2, 1) is $a\sqrt{b}$ and b = _____ .

*(50) 113600 ÷ 355 = _____ .

(51) If the sum of four consecutive odd numbers is 88, the largest is _____.

(52) If $5x^2 - \frac{2x}{7} = 1/7$ and $x > 0$, x = _____ .

(53) How many ounces of water would be needed to reduce 15 ounces of a solution containing 50% acid to a solution containing 30% acid? _____ oz.

(54) The remainder when 981031 is divided by eleven is

_____

(55) $\log_4 8 - \log_4 16$ = _____ .

(56) 4(mod 9) × 7(mod 9) = _____ (mod 9).

(57) Write the value of $0.\overline{405}$ as a common fraction.

_____

(58) The slope of the line perpendicular to the line $\frac{2x}{3} - \frac{4y}{9} = 1/8$ is _____ .

(59) The number of different seven-letter words, real or imaginary, that can be constructed using the letters "c, r, y, b, a, b, y" is _____

*(60) The radius of the circle $16x^2 + 16y^2 = 25{,}600$ is

_____

(61) If $x^2 - xy - 6 = 0$ and $y + 2x = 3$ and $x > 0$, x =

_____

(62) The number of digits in the number $N = 2^{17} \times 5^{12}$ is

_____

(63) Find the area of the ellipse $100y^2 + 441x^2 = 44{,}100$. (Use pi = 22/7) _____ .

(64) How many different seven-digit numbers are there that are divisible by 5? _____ .

(65) One gallon of paint will cover 300 sq. ft. and costs $7.99. How much will it cost to paint the floor and the walls of a storage room with no windows or doors if the room is 10 7/8′ × 20′ × 8′ in height assuming you must buy the entire gallon of paint if you need any part of it? $_____ .

(66) The sum of the infinite geometric series 7/2 + 3/2 + 9/14 + 27/98 + . . . is _____ .

(67) 222, base four, ÷ 3, base four = _____ , base four.

(68) How many different six-member committees can be constructed from a club that has eleven members?

_____

(69) A student buys a math text for $13.50, English text for $11.90, history text for $8.80, and a biology manual for $6.00. If the bookstore gives a 15% discount, what will the entire purchase cost?

$_____.

*(70) If $\log_{180}[(10^2)(x)] = 3$, x = _____ .

(71) If three coins are tossed, what are the odds of obtaining exactly two tails? _____.

(72) The largest possible value of $f(x) = 3x - 6x^2$ is

_____

(73) $\frac{9\ 1/3 - 1\ 1/2}{6\ 1/4 - 3\ 1/3}$ = _____ .

(74) The horizontal asymptote for $f(x) = \frac{5x + 1}{2 - 3x}$ is

y = _____.

(75) The second derivative of $f(x) = 3x^2 - 4x^{-1}$ when x = 2 is _____

(76) If $f(x) = 3x^4 - 5x^3 + k$, determine k so that f(x) is divisible by x − 2. _____ .

(77) $\int_{-1}^{3} 4x^2 dx$ = _____ .

(78) $A = \begin{bmatrix} -1 & 1/2 \\ 1/2 & 3/4 \end{bmatrix}$ and $B = \begin{bmatrix} 6 \\ -8 \end{bmatrix}$, $AB = \begin{bmatrix} \quad \end{bmatrix}$.

(79) The probability that you will finish this test is 13/20. What are the odds that you will not finish this test?

_____

*(80) $\sum_{x=1}^{12} (3x^2 - 4) - 2$ = _____ .

The University of Texas Interscholastic League

Number Sense Test, Series LL-4

Contestant's Number_____ Contestant's Score_____

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Stop—Wait for Signal

(1) 52109 + 98764 = _____ .

(2) 30102 − 6935 = _____ .

(3) 7 3/5 + 8 5/9 = _____ .

(4) 4 2/5 − 3 7/8 = _____ .

(5) 168 is what percent less than 800? _____ %.

(6) 9 3/7 × 4 2/7 = _____ .

(7) If you bought a suit for $249.95, a shirt for $14.95, and a tie for $7.55, how much change would you receive from $300.00? $_____

(8) What is the largest positive integer whose square is less than 150? _____

(9) 16 × 25 + 8 × 30 = _____ .

*(10) 28 × 76 + 34 × 91 − 7 × 6 = _____ .

(11) The average of 98 1/2, 73 1/2, and 68 is _____ .

(12) 864 × 11 = _____ .

(13) If one inch equals 2.54 centimeters, 76 1/5 centimeters = _____ in.

(14) If set A has 87 elements and set B has 64 elements and the union of A and B has 130 elements, how many elements are in the intersection set of A and B? _____

(15) 8 1/2 + 6.23 − 4.6 = _____ .

(16) Which is the largest 19/21, 7/8, or .8751? _____ .

(17) The greatest common divisor of 78, 117, and 156 is _____

(18) The least common multiple of 78, 117, and 156 is _____

(19) It takes a bus 89 hours to travel across Canada to its destination. If the bus leaves at 9 o'clock, it will arrive at its destination at _____ o'clock. (Same time zone.)

*(20) $\sqrt{230400}$ = _____ .

(21) If the sum of four consecutive odd numbers is 160, the largest of these is _____ .

(22) The product of the distinct prime divisors of 550 is _____

(23) You score 10 on the first test in mathematics. How many consecutive 100's would you have to make to raise your average to 90? _____

(24) If $f(x) = \frac{5x^2}{4} - |5 - \frac{8x}{3}|$, f (−8) = _____ .

(25) 17 1/2 is to 50 as 3/20 is to _____ .

(26) A merchant buys an article at "$48 less 12 1/2%". He then wishes to make a profit of 33 1/3% of his cost. What should he sell the article for? $_____

(27) Change 2310, base five, to base ten. _____ .

(28) The area of an equilateral triangle with side 12 is $a\sqrt{b}$ and a = _____

(29) The sum of two positive integers is 7. Twice the smaller integer squared minus 3 equals the larger integer. What is the smaller of the two integers? _____

*(30) 671 × 295 ÷ 55 + 1 = _____ .

(31) Determine k so that the sum of the roots of $3kx^2 + \frac{3x}{2} = 7$ is 4. _____ .

(32) 496 × 111 = _____ .

(33) How many different sets of three books can be selected from 18 distinct books? _____ .

(34) Solve for y: $3x + z = 1$

$y + z = 2$

$y - 6x = 2$; y = _____ .

(35) The remainder when 1021864 is divided by 3 is _____

(36) $(325)^2$ = _____ .

(37) If one liter = .26 gallons, at $ .60 per gallon, 30 liters will cost $_____

(38) The volume of a sphere with radius 3 1/2 is _____ (use pi = 22/7)

(39) The radii of two circles are 9 and 12, respectively. The ratio of the area of the smaller to the area of the larger circle is _____

*(40) 17 miles = _____ rds.

(41) If a car can travel 26 miles on one gallon of gasoline and if gasoline sells for $ .55 per gallon, how much will the gasoline cost to travel 1170 miles? $_____

(42) The smallest value of n such that $3n^2 - 5n + 2 = 0$ is _____

(43) Joe bought a farm. He paid \$15,000 down and owed a balance of \$65,000. He signed a mortgage for the \$65,000 remainder due. It provided that he pay nothing for ten years. At the end of ten years he was required to pay the \$65,000 plus 8 1/2% simple interest. How much did the farm cost him?

\$_____ (including interest).

(44) $\sqrt{42849}$ = _____ .

(45) Assuming that boys and girls are born with equal frequency, what is the probability of having exactly two boys in a three-child family? _____ .

(46) 113, base fifteen, minus 79, base fifteen = _____, base fifteen.

(47) The largest possible value of x such that $6x^2 + 5x \leq 4$ is _____.

(48) The number of solutions of $\{a, b, c\} \subseteq \overline{\underline{X}} \subseteq \{a, b, c, d, e, f\}$ where $\overline{\underline{X}}$ is a set, is _____.

(49) The midpoint of the line segment with endpoints $(-3/7, 1/2)$ and $(2/5, 1/9)$ is _____ .

*(50) $(81)^3 - (131)^2$ = _____ .

(51) The median of 78 1/2, 91 1/2, 89 2/3 and 60 1/3 is _____.

(52) 9.546 ÷ 2.58 = _____ .

(53) If $f(x, y) = x^{y-2} + y^{3x}$, $f(-2, 2)$ = _____ .

(54) Write $7.\overline{18}$ as a common fraction. _____ .

(55) The coefficient of the second term in the binomial expansion of $(2x^2 - 3y)^5$ is _____

(56) The center of the circle $2x^2 + 3x + 2y^2 - 6y = 20$ is _____

(57) Change 302, base four, to base eight. _____, base eight.

(58) The discriminant of $5x^2 - \frac{2x}{3} + \frac{5}{12} = 0$ is _____

(59) If a code consists of one or two or three letters, how many different codes can be given using the letters "a, b, c" if repetition of letters is not permitted? _____

*(60) 74 × 85 × 96 = _____ .

(61) Sin arc tan $\frac{\sqrt{3}}{3}$ + [cos arc sin $\frac{\sqrt{2}}{2}$]^2 = _____ (Using principal values)

(62) Find the slope of the line $\frac{7x}{2} - \frac{y}{6} = 8$.

_____

(63) 59, base eleven, x 8, base eleven, = _____, base eleven.

(64) $\log_{\frac{1}{4}} [(125)^2 (25)^{-2} (625)^{\frac{1}{4}}]$ = _____ .

(65) The distance between the points (1/3, 1) and (2, −1) is $a\sqrt{b}$ and b = _____ .

(66) A line joins the points (2, −2) and (2, 1). Its x-intercept is _____

(67) 76 pecks = _____ bushels.

(68) If $4^{2x} \cdot 2^2 = 64$, x = _____ .

(69) The sum of the coefficients of all the terms in the expansion of $(5x - 3y)^7$ is _____

*(70) (488236 ÷ 742) + 2 = _____ .

(71) The smallest of any two prime numbers whose sum is 90 is _____.

(72) A farmer bought 85 cows. He sold 80 of them for the price paid for the 85 cows. The remaining 5 cows were sold at the same price per head as the other 80. The gain was what percent of the investment? _____%.

(73) The slope of the line tangent to $f(x) = 5x^2 - 3x^3 + 2x$ at x = 1 is _____ .

(74) If two dice are tossed, what are the odds that the sum of the faces will be six? _____ .

(75) If $x = \frac{1 - i\sqrt{3}}{2}$, $x^2 - x$ = _____ .

(76) If (−2, y) lies on the line joining the points (1, −2) and (2, 0) then y = _____

(77) $\sum_{x=1}^{4} (\frac{x}{2} - 3)$ = _____

(78) The second derivative of $f(x) = \frac{4x^3}{3} - \frac{5x^2}{2} + 6$ is _____

(79) If $A = \begin{bmatrix} 1/2 & 1 \\ -2 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 6 \\ 3 \end{bmatrix}$, AB = $\begin{bmatrix} \quad \end{bmatrix}$.

*(80) The surface area of a cube with edge 45 ft. = _____ sq. ft.

The University of Texas Interscholastic League

Note: If error is found in this
answer. The state office will ap

Answer Key-Number Sense Test LL-A

1. 107013
2. 22534
3. 122
4. 243
5. 7336
6. 20/63
7. $1.90
8. $367.50
9. 5137
*10. 83885 - 92715
11. 7/12
12. 32
13. 240 cm.
14. 8/29
15. 9.78
16. 73
17. 10
18. 37
19. -20/3 or -6 2/3
*20. 1776481 - 1963479
21. 13%
22. 105 3/4 or 105.75
23. 63
24. 65
25. $ .30
26. $9.45
27. 9 5/12 ft.
28. 4 (mod 9)
29. -8/31
*30. 931 - 1029
31. 2
32. -5/3 or -1 2/3
33. -1
34. 15
35. 2520
36. 25
37. 2
38. -2/3
39. 26, base seven
*40. 627 - 693
41. -1/2
42. 3
43. 1320
44. 5/14
45. 210
46. 117/110
47. 4225
48. 131 7/12 or 1579/12
49. 1/4 or .25
*50. 2812 - 3108 pts.
51. 149
52. 10
53. $49,400.00
54. 9
55. 3
56. 1/220
57. -5/6
58. 5.5 or 5 1/2 or 11/2
59. 12133, base four
*60. $4433555 - $4900245
61. (7/4, -8/3) or (1 3/4, -2 2/3)
62. -4
63. (3/2, -1/2) or (1 1/2, -1/2)
64. 3
65. 39
66. 70
67. -10
68. $\begin{bmatrix} 9 \\ 9 \end{bmatrix}$
69. 1/2 x $^{-4}$ + 6
*70. 52136 - 57624

Answer Key-Number Sense Test LL-B

1. 81552
2. 23782
3. -43/22 or -1 21/22
4. 125/2 or 62 1/2 or 62.5
5. 75%
6. $6.04
7. 2809
8. 16
9. 3
*10. 131328 - 145152
11. 84.5 or 84 1/2 or 169/2
12. 66
13. 540 cm.
14. 2/7
15. 7205
16. 8 4/63 or 508/63
17. $15,000.00
18. 11/16
19. 1020
*20. 700397 - 774123
21. 8 days
22. 6
23. 2376
24. 1111, base five
25. 10
26. $20.60
27. 147 1/4 or 147.25
28. 5 gallons
29. 65
*30. 760 - 840
31. 7
32. 356
33. -1
34. 41
35. 13/36
36. 5
37. 2/3
38. 683/330
39. -23
*40. 399000 - 441000
41. 24 mph
42. 3
43. -5/9
44. 1500, base six
45. 50%
46. 680
47. 35200
48. 77
49. $4.52
*50. 16625 - 18375
51. 336
52. 1
53. 5/2 or 2 1/2 or 2.5
54. -7/2
55. 1/8
56. 27/8 or 3 3/8
57. (5, -23/2) or (5, -11 1/2)
58. 123 11/12
59. -10
*60. 8308 - 9177
61. $1587.60
62. 2
63. -3x -^{4}/2
64. -1/2 or -.5
65. -4/3 or -1 1/3
66. $\begin{bmatrix} -7 \\ 7 \\ .5 \end{bmatrix}$
67. -16
68. 196
69. 0.34, base five
*70. 10944 - 12096 acres

Answer Key-Number Sense Test LL-C

1. 9459
2. 26873
3. 1 43/45 or 88/45
4. 14/5 or 2 4/5 or 2.8
5. 6129
6. 93025
7. 59
8. 13/10 or 1.3
9. 40 gal
*10. 74309-82131
11. 16 1/4 or 65/4
12. 5313
13. 42 ft.
14. 90 mph
15. $1.04
16. 73
17. 49
18. $8.91
19. 15%
*20. 511423 - 565257
21. 234, base eight
22. 26
23. $1.17
24. 70
25. 30 3/4 or 30.75 or 123/4
26. 21%
27. (1, -1/6)
28. 33
29. 9/71
*30. 722 - 798
31. 4960
32. 9
33. 7
34. 3528
35. 5
36. 3 (mod 11)
37. $240.00
38. 8
39. 0
*40. 98496 - 108864 cu. in.
41. 5000 yds.
42. 384
43. 11/3 or 3 2/3
44. -1
45. 221, base six
46. 3
47. -10
48. 6840
49. $475.38
*50. 175940 - 194460
51. 1/2 or .5
52. .32 or 8/25
53. 5/4 or 1 1/4 or 1.25
54. 6
55. 9
56. -7/9
57. -17
58. (3/8, 7/16)
59. 2
*60. 62168 - 68712
61. -1/4 or -.25
62. 32/21 or 1 11/21
63. -4
64. 2/3
65. 87
66. 3 - x/2
67. -7
68. 5/31
69. -1/243
*70. 9595 - 10605

Number Sense Contest LL-1-Answer Key

1. 94796
2. 179188
3. 5960
4. 178
5. 43/56
6. 164025
7. 5
8. 574
9. 2/7
*10. 889200 - 982800
11. 16%
12. 99
13. $175.00
14. 24
15. $29.45
16. 238
17. 31
18. 92
19. 35
*20. 434511 - 480249
21. 15 acres
22. 726
23. $8.91
24. 33
25. 7117
26. 18
27. 251, base seven
28. 828
29. $204.00
*30. 836 - 924
31. 1
32. 1386
33. 5/7
34. 137
35. 7
36. 4
37. 7/17
38. 234 in.
39. 92, base thirteen
*40. 672790 - 743610
41. $17.25
42. 0
43. 10
44. 161 1/4 or 161.25 or 645/4
45. 102
46. 67 1/2% or 67.5%
47. 23
48. 69819
49. 400
*50. 43928 - 48552
51. 1
52. 1
53. 8
54. 5
55. 45
56. 27/37
57. 4/3 or 1 1/3
58. 286
59. 13/12 or 1 1/12
*60. 34419735 - 38042865
61. 234, base fourteen
62. 5
63. 76 miles
64. 999
65. 35
66. -15
67. 8000 grams
68. 1/17
69. 1/220
*70. 11495 - 12705
71. 10
72. .36 or 9/25
73. 18
74. 2 (mod 7)
75. 1
76. -8x^2/3
77. 2
78. 9
79. -40
*80. 80256 - 88704

Number Sense Contest LL-2-Answer Key

1. 158502
2. 284668
3. 5803
4. 254
5. 56/65
6. 7360
7. 99225
8. 20/3 or 6 2/3
9. 1920 sq. rd.
*10. 120460 - 133140
11. $142.00
12. 829
13. $9000.00
14. 21
15. 8162
16. 60
17. 88
18. 23/12 or 1 11/12
19. 34
*20. 12331 - 13629
21. 228
22. 293/385
23. 17
24. 53
25. 360
26. 10
27. $337.50
28. 14
29. 38 feet
*30. 874 - 966
31. 240.5 or 240 1/2 or 481/2
32. 864
33. 6
34. 9/16
35. $1.60
36. -17
37. 12
38. 2
39. 8/23
*40. 10032 - 11088
41. 195 in.
42. 89, base thirteen
43. -2
44. 81.25% or 81 1/4%
45. 17
46. 48507
47. 64
48. 7
49. 65%
*50. 705.375 - 779.625 gal.
51. 2
52. 17
53. 25/37
54. -6/5 or -1 1/5 or -1.2
55. 47
56. 301, base eleven
57. 990
58. 6
59. 25/102
*60. 73568 - 81312
61. 7/6 or 1 1/6
62. 56
63. 2497
64. 8
65. 7
66. 38
67. (-3/2, 7) or (-1 1/2, 7) or (-1.5, 7)
68. 0
69. 4/9
*70. 3686 - 4074
71. 4 (mod 8)
72. 50
73. π/4
74. 18
75. 26
76. 7
77. 0.875 or 7/8
78. 640 ounces
79. -1 7/9 or -16/9
*80. 178068 - 196812

Number Sense Contest LL-3-Answer Key

1. 161394
2. 1687
3. 8 1/6 or 49/6
4. 7623
5. 198
6. 276
7. 67
8. 16
9. 1/3
*10. 123557 - 136563
11. -11/14
12. $6.37
13. 13 1/2 or 27/2 or 13.5
14. 8
15. 54723
16. .64
17. 15%
18. 88
19. $12.03
*20. 231667 - 256053
21. 29/30
22. 9
23. 1386
24. 88 kilometers
25. 323, base seven
26. 114
27. 23/90
28. 51 sq. in.
29. 5476
*30. 353495 - 390705
31. 21 1/2 or 21.5 or 43/2
32. 1/4
33. $900.00
34. 1734
35. 154
36. 3
37. 300%
38. 1/5525
39. 7
*40. 8721 - 9639 cu. ft.
41. $150.00
42. 112, bas
43. -5 1/2 c
44. (-1/3, 5
45. 3/8
46. 81%
47. 91
48. $7.47
49. 29
*50. 304 - 33
51. 25
52. 1/5
53. 10 oz.
54. 7
55. -1/2
56. 1 (mod
57. 15/37
58. -2/3
59. 1260
*60. 38 - 42
61. 2
62. 14
63. 660
64. 1,800,00
65. $23.97
66. 49/8 or
67. 32, base
68. 462
69. $34.17
70. 55404 -
71. 3/5 or .6
72. 3/8
73. 94/35 or
74. -5/3
75. 5
76. -8
77. 37 1/3 o
78. $\begin{bmatrix} -10 \\ -3 \end{bmatrix}$
79. 7/13
*80. 1805 - 1

Number Sens
LL-4-Answe

1. 150873
2. 23167
3. 16 7/45
4. 21/40
5. 79%
6. 1980/49
7. $27.55
8. 12
9. 640
*10. 4921 - 5
11. 80
12. 9504
13. 30 in.
14. 21
15. 10.13
16. 19/21
17. 39
18. 468
19. 2 o'clock