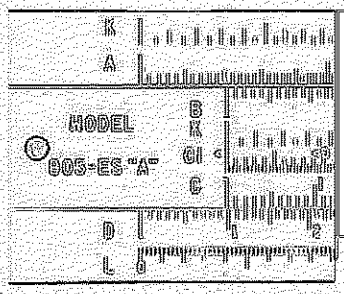
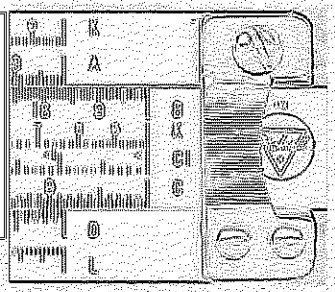
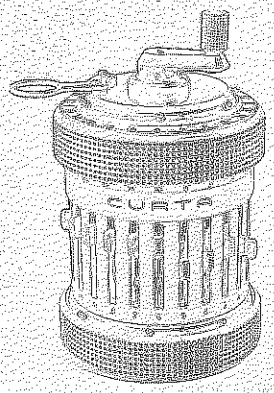
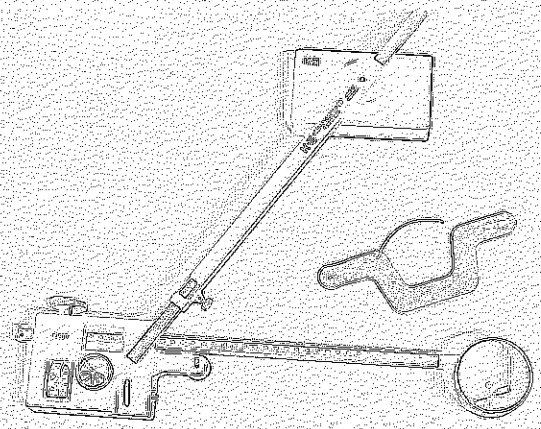


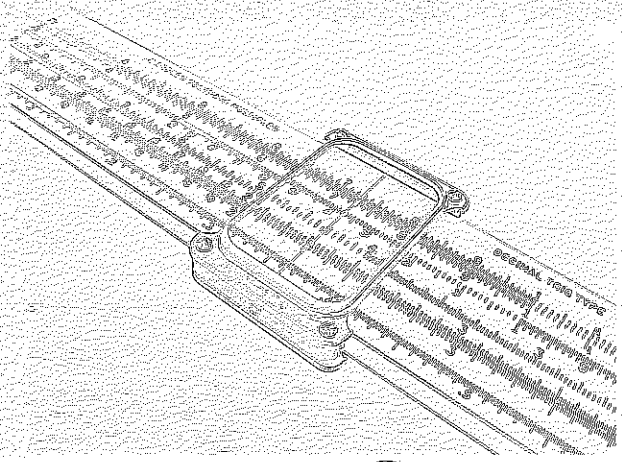
Texas Competitive Mathematics
Web - http://www.texasmath.org
Fax - (206) 666-MATH/(206) 666-6284
E-Mail - webmaster@texasmath.org

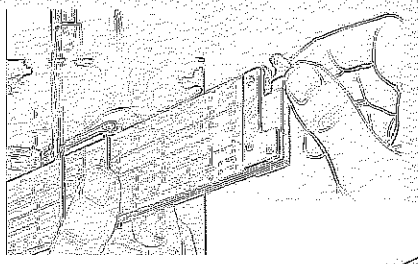


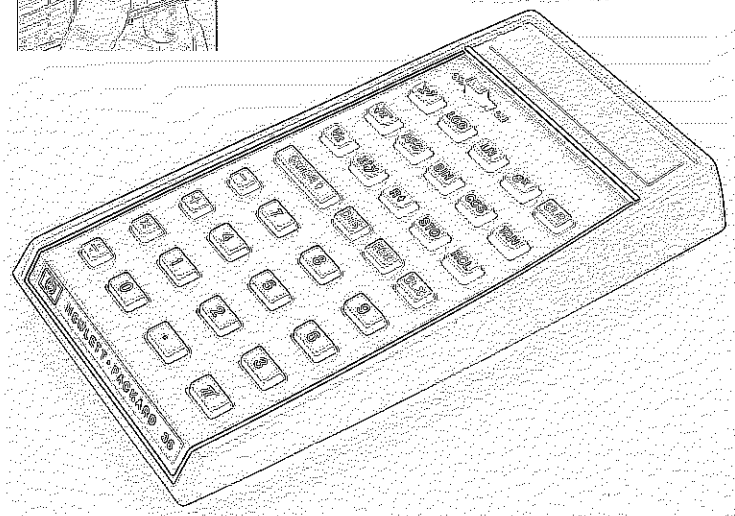
1976-77 UIL Number Sense
(10 pages)

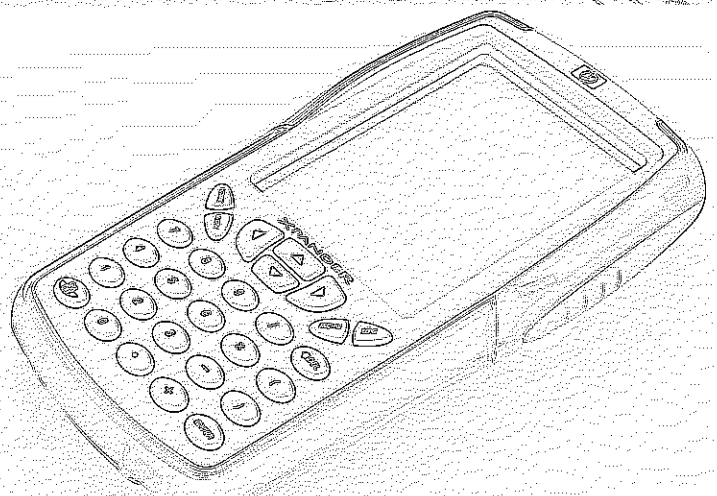


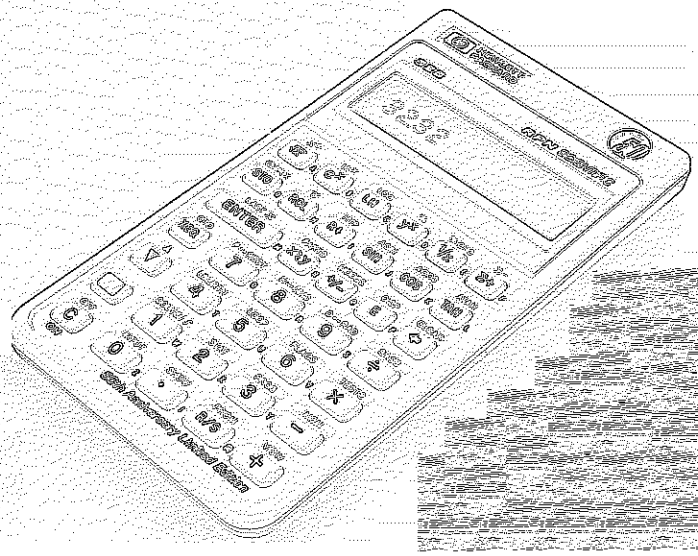


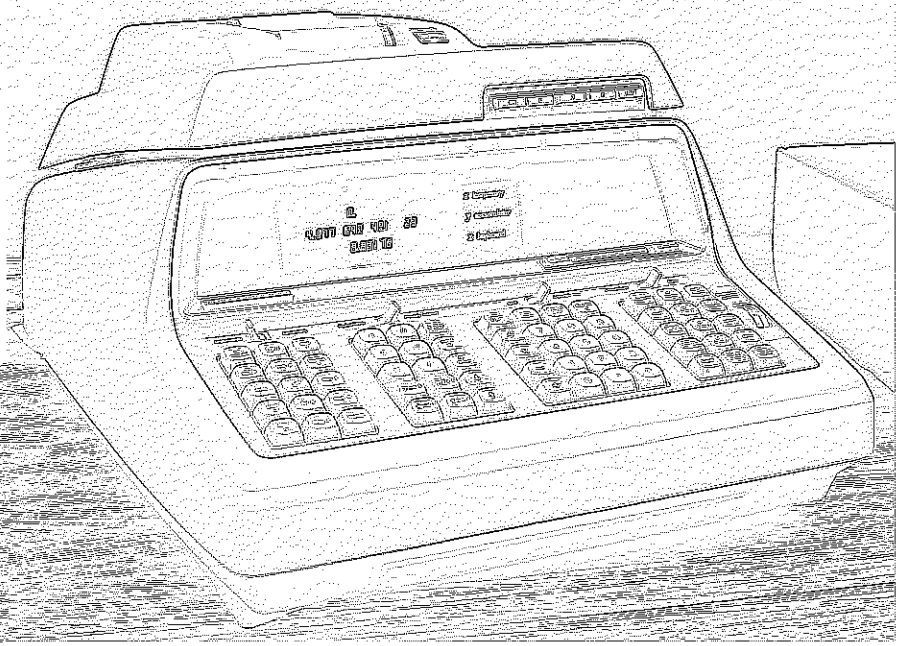












The University of Texas Interscholastic League

Number Sense Test, Series JJ-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) $3469 + 8124 =$ .....

(2) $6121 - 4385 =$ .....

(3) $482 + 671 - 328 =$ .....

(4) $\frac{2}{3}$ of $19\frac{1}{2} =$ .....

(5) $91 \times 37 =$ .....

(6) $28 + 36 + 41 + 17 =$ .....

(7) $1\frac{3}{8} \div 2\frac{3}{4} =$ .....

(8) $\sqrt{1296} =$ .....

(9) $\frac{2}{5} + \frac{3}{8} + \frac{1}{4} =$ .....

*(10) $4691 + 847 + 9382 =$ .....

(11) $6919 \div 11 =$ .....

(12) 45% of 380 = ...

(13) If $x + 249 = 761$, $x =$ .....

(14) $26\,5/7 - 15\,9/14 =$ .....

(15) The greatest common divisor of 192 and 144 is .....

(16) The least common multiple of 192 and 144 is .....

(17) Change 56, base seven, to base ten. .....

(18) Change 45, base ten, to base six. ....., base six.

(19) $432 \times 11 =$ .....

*(20) $579 \times 84 + 4 =$ .....

(21) The average of 49, 27, and 86 is .....

(22) The median of 56, 28, 44, 76, and 50 is .....

(23) The interest on \$210 for 150 days at 8% is \$.....

(24) $27 \times 19 =$ .....

(25) $(65)^2 =$ .....

(26) If 7 lbs. of meat costs \$5.53, at the same rate,

10 lbs. will cost \$.....

(27) Find the base of a triangle whose altitude is 9 and

whose area is 63. .....

(28) 121, base three, multiplied by 2, base three, = ...

....., base three.

(29) $\frac{7}{8} =$ .....%.

*(30) $(49)^4 - 1 =$ .....

(31) 3 hours 25 minutes = ... seconds.

(32) 478, base nine, added to 564, base nine, = ...

....., base nine.

(33) In a shipment 420 items were found to be defective with either dents or discolor. 380 had dents and 75 were discolored. How many were only discolored? .....

(34) Write as a common fraction: $1.\overline{24} =$ .....

(35) Solve for x: $\begin{aligned} 2x + y &= 4 \\ x - z &= -2 \\ y + z &= 6; \end{aligned}$ x = ...

(36) $4.24 \div 5.3 =$ .....

(37) If $12\frac{1}{2}$ pesos equals one dollar, \$40 = ... pesos.

(38) If $\frac{2x}{5} - x \leq 8 + x$, the smallest value of x is .....

(39) If $\log_4 1/16 = x$, x = ...

*(40) $20 \times 120 \times 220 =$ .....

(41) The sum of the roots of $12x^2 = 3$ is .....

(42) The product of the roots of $12x^2 = 3$ is .....

(43) Find the average of 19, 21, 35, 17, and 13. .....

(44) $54 \times 111 =$ .....

(45) The remainder when 5106 is divided by 9 is .....

(46) If $f(x) = 5x^2 - 3x^3$, $f(-2) =$ .....

(47) The smaller of 19/21 and 22/25 is .....

(48) Find the smaller of two integers whose sum is 77 and whose difference is 5. .....

(49) Change 11011001, base two, to base four. ....., base four.

*(50) The volume of a sphere whose diameter is 30 is $a\pi$ and a = ...

(51) $\frac{1}{2} + 1/7 + 1/9 =$ .....

(52) Change 47, base eight, to base five. ....., base five.

(53) If 1 gram equals .04 oz., 12 lbs. = ... grams.

(54) When two dice are tossed, what is the probability that the difference of the faces is 3? .....

(55) The slope of the line containing the point (1, —3) and whose y intercept is ½ is .....

(56) The smallest value of x so that $|4x - 2| \leq 3$ is .....

(57) If $\frac{a}{19}$ has a remainder of 12 and $\frac{b}{19}$ has a remainder of 14, $\frac{ab}{19}$ has a remainder of .....

(58) How many 5 letters words, real or imaginary, can be constructed using the letters "b,b,c,d,e"? .....

(59) The distance between the points (⅔,-2) and (4,-5) is, in simplified form, $a\sqrt{b}$ and a = ...

*(60) 75 acres = ... sq. rds.

(61) If $2^x - x^2 = 7$, x = ...

(62) If the odds of winning a race are 7 to 9, what is the probability of winning the race? .....

(63) How many positive integers with less than three digits can be formed using the set {1, 3, 5, 6, 7} if repetition of the digits is not permitted? .....

(64) The x-intercept of the line $3y - 4x = 8$ is .....

(65) If x and y vary directly and x = 6 when y = 30, find x when y = 5. .....

(66) The maximum value of the function $f(x) = -5x^2 + 3$ is .....

(67) The slope of the line tangent to the curve $y = 5x^3 - 3x + 1$ at the point (1,3) is .....

(68) The remainder when $f(x) = 6x - 4x^2 + 8x + 2$ is divided by (x — 3) is .....

(69) If $G(X) = \frac{5 - 2x}{4}$ and $G^{-1}(X) = ax + b$, a = ...

*(70) 4455220 ÷ 847 = ...

(71) The coefficient of the x^2y^6 term in the binomial expansion of $(3x - \frac{y^2}{6})^5$ is .....

(72) The smallest critical value of $f(x) = \frac{5x - 6}{2x^2 + 3x - 2}$ is .....

(73) The discriminant of $2x^2 - 4x = 7$ is .....

(74) $(4 - 4i)(1 + i) =$ .....

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

(76) The sum of the coefficients in the binomial expansion of $(3x - \frac{3y}{2})^4$ is .....

(77) Find the sum of the infinite geometric series:

$1 + ⅓ + 1/9 + 1/27 + \ldots =$ .....

(78) If matrix $A = \begin{bmatrix} -1 & 0 \\ 2 & ½ \end{bmatrix}$ and matrix $B = \begin{bmatrix} 3 & 4 \\ 2 & -4 \end{bmatrix}$ then $AB = \begin{bmatrix} & \\ & \end{bmatrix}$.

(79) The second derivative of the function $f(x) = 5x^2 - 6x + 3$ is .....

*(80) $\sum_{x=1}^{10} 4x^2 =$ .....

The University of Texas Interscholastic League

Number Sense Test, Series JJ-2

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) $20463 + 94688 =$ .....

(2) $51602 - 8478 =$ .....

(3) $2561 + 1829 + 748 =$ .....

(4) $3562 - 384 + 5692 =$ .....

(5) 5% of 876 = ...

(6) $83 \times 43 =$ .....

(7) $4592 \div 56 =$ .....

(8) $7\frac{1}{2} \div 1\frac{1}{4} =$ .....

(9) $36^2 =$ .....

*(10) $18074 + 859472 + 9274 =$ .....

(11) If $x + 241 = 826$, $x =$ .....

(12) $\sqrt{2704} =$ .....

(13) $8173 \div 11 =$ .....

(14) $50.96 \div 5.2 =$ .....

(15) If 6 items cost $6.90, at the same price per item, 8 items will cost $.....

(16) $4\ 2/7 - 3\frac{3}{4} =$ .....

(17) The greatest common divisor of 72 and 378 is .....

(18) The least common multiple of 72 and 378 is .....

(19) $5\frac{3}{5}$ is what per cent less than 8? .....%.

*(20) $7^6 - 9 =$ .....

(21) Change 57, base ten, to base five. ....., base five.

(22) Change 67, base nine, to base ten. .....

(23) Find the average of 12, 9, 14, 17, and 8. .....

(24) $586 \times 11 =$ .....

(25) The perimeter of a right triangle whose legs are 9 and 12 is .....

(26) The median of 36, 50, 47, 45, and 25 is .....

(27) $(45)^2 =$ .....

(28) At 12½ pesos per dollar, 475 pesos = $.....

(29) 4600 sec. = ... hrs.

*(30) $562 \times 84 - 8 =$ .....

(31) 57, base eight, added to 44, base eight = ..., base eight.

(32) $56 \times 38 =$ .....

(33) Write as a common fraction: $1.4\overline{6} =$ .....

(34) If $\frac{3x+1}{4} - x = 1$, $x =$ .....

(35) $47 \times 111 =$ .....

(36) The remainder when 20176 is divided by 3 is .....

(37) The length of a rectangle is twice its width and its diagonal is $3\sqrt{5}$. Find the width. .....

(38) $x + y = -1$

Solve for x: $y - 3 = -3$

$2x + 3 = 1$, $x =$ .....

(39) Find the smaller of two integers whose product is 65 and whose sum is 18. .....

*(40) $2657280 \div 384 =$ .....

(41) The remainder when 43017 is divided by 11 is .....

(42) The larger of $\frac{27}{31}$ and $\frac{35}{41}$ is .....

(43) Change 702, base eight, to base two. ....., base two.

(44) Determine how many two digit positive integers are even. .....

(45) The product of the roots of $\frac{x^2}{3} - 4x + 6 = 0$ is .....

(46) The sum of the roots of $\frac{x^2}{3} - 4x + 6 = 0$ is .....

(47) If 1 gram equals .04 oz., 7600 grams = ... lbs.

(48) $\frac{1}{2} + \frac{1}{5} + 1/7 =$ .....

(49) The sum of the distinct prime divisors of 360 is .....

*(50) $102 \times 205 \times 306 =$ .....

(51) The slope of the line $\frac{y}{2} - 4x = 6$ is .....

(52) If $f(X) = 3x(2 - 4x) + 6$, $f(-2) =$ .....

(53) Find the area of a trapezoid whose height is 7 and whose bases are 6 and 8. .....

(54) If $x > 0$ and $\log_3 (x^2 - 2) = 3$, $x =$ .....

(55) The median of 17, 21, 37, 27 is .....

(56) Find the slope of the line containing the point (3,4) and whose x intercept is —2. .....

(57) When two dice are tossed, what is the probability that the sum of the faces is 10? .....

(58) The largest value of x so that $| 2x - 3 | \leq 1$ is .....

(59) 462, base eight, divided by 22, base eight = ..., base eight.

*(60) $\sqrt{48720400} =$ .....

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

(62) If $\frac{a}{23}$ has a remainder of 7 and $\frac{b}{23}$ has a remainder of 21, $\frac{ab}{23}$ has a remainder of .....

(63) If $3^x - x^3 = 17$, $x =$ .....

(64) If $y = \sqrt{x - 1}$, the smallest real value in the domain is .....

(65) If x and y vary indirectly and $x = 3$ when $y = -2$, find y when $x = -1/7$. .....

(66) How many 5 letters words, real or imaginary, can be constructed using the letters "c,a,b,a,c"? .....

(67) If the probability of making a good grade is $\frac{5}{14}$, what are the odds of making a good grade? .....

(68) The minimum value of the function $f(X) = x^2 - 3x$ is .....

(69) The sum of the coefficients in the binomial expansion of $(\frac{3x^2}{4} + \frac{y}{2})^2$ is .....

*(70) 55 cu. ft. = ... cu. in.

(71) The remainder when $f(x) = 5x - 3x^3 + 2x^2 - 5$ is divided by $x - 2$ is .....

(72) $\frac{(3 + i)(i - 4)}{i} = a + bi$ and $a =$ .....

(73) Hoy many different five-member committees can be formed from a group of eight people? .....

(74) The slope of the line tangent to the curve $y = x^4 - 2x + 3$ at the point (2,15) is .....

(75) $\int_0^2 (5x^4 - 2x)\, dx =$ .....

(76) The discriminant of $5x^2 - 2x + 3 = 0$ is .....

(77) The horizontal asymptote of $y = \frac{4}{x - 3}$ is $y =$ .....

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

(79) The sum of the infinite geometric series $2 + \frac{1}{2} + \frac{1}{8} + 1/32 + \ldots$ is .....

*(80) The volume of a right circular cone whose diameter is 78 and whose height is 100 is $a\pi$ and $a =$ .....

The University of Texas Interscholastic League

Number Sense Test, Series JJ-3

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

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Stop—Wait for Signal

(1) $20458 + 69824 =$ .....

(2) $92082 - 48893 =$ .....

(3) $1258 \times 8 =$ .....

(4) $6089 + 38247 + 540395 =$ .....

(5) $5281 + 6983 - 4786 =$ .....

(6) $17262 \div 63 =$ .....

(7) $11\frac{7}{8} + 6\frac{1}{4} =$ .....

(8) $54^2 =$ .....

(9) $14\frac{1}{6} - 7\frac{2}{3} =$ .....

*(10) $3689 + 30258 + 2504 + 5230 + 4519 =$ .....

(11) $52 \times 87 =$ .....

(12) $4\frac{4}{5} \div 4\frac{2}{5} =$ .....

(13) $574 \times 11 =$ .....

(14) If $x + 3677 = 4051$, $x =$ .....

(15) $52.1 - 2.18 + 8\% =$ .....

(16) The average of 42, 58, 21 and 23 is .....

(17) $\sqrt{961} =$ .....

(18) If 1 gram equals .04 oz., 5600 grams = ... lbs.

(19) $8\frac{3}{4} \times 12\frac{3}{4} =$ .....

*(20) $458 \times 580 =$ .....

(21) The greatest common divisor of 198 and 154 is .....

(22) The least common multiple of 198 and 154 is .....

(23) The larger of $\frac{18}{23}$ and .77 is .....

(24) The volume of a cylinder is 363π and its diameter is 22.

Find the height. .....

(25) One of the equal sides of an isosceles triangle is $\sqrt{109}$

and its height is 10. Find the area. .....

(26) The median of 57, 61, 42, 60 is .....

(27) $(75)^2 =$ .....

(28) Change 412, base five, to base ten. .....

(29) Change 76, base ten, to base three. ....., base three.

*(30) $8^6 - 4 =$ .....

(31) The product of the roots of $5x - \frac{4x^2}{3} = 8$ is .....

(32) The sum of the roots of $5x - \frac{4x^2}{3} = 8$ is .....

(33) If $1\frac{1}{2}$ lbs. of meat costs $1.95, at the same price per lb.,

5 lbs. will cost $.....

(34) The sum of the distinct prime divisors of 471 is .....

(35) Write as a common fraction: .05610561 .....

(36) $528 \times 111 =$ .....

(37) If one side of a trapezoid is twice as long as the other and

the shorter side is 17, find the area if the height is 8. .....

(38) 516, base seven, multiplied by 5, base seven, = ... , base seven.

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

*(40) 8 hr. 25 min. = ... sec.

(41) $4x + z = 3$
Solve for z: $2x + y = 1$
$z + 2y = 3$, z = ...

(42) The remainder when 21074 is divided by three is .....

(43) The center of the circle $x^2 - 6x + y^2 + 2y = 5$ is ..... (..... , ...) .....

(44) The slope of the line containing the points $(5, \frac{7}{2})$ and $(3, \frac{2}{3})$ is .....

(45) Assuming that boys and girls are born with equal frequency what is the probability of having at least one boy in a three child family? .....

(46) If $4^2 \times 2^5 \div 16^{-1} = 2^x$, x = ...

(47) The smallest value of x such that $\frac{4x}{3} - 4 \leq 3x$ is .....

(48) If 12½ pesos equal one dollar, 190 pesos = $.....

(49) The remainder when 46091 is divided by eleven is .....

*(50) $\sqrt{702244} + 2 =$ .....

(51) If a box contains 10 balls, how many different sets of 3 balls can be selected? .....

(52) The smaller of $\frac{34}{37}$ and .91 is .....

(53) The distance between the points (1, —2) and (½, 2), in simplified form, is $a\sqrt{b}$ and b = ...

(54) Change 436, base eight, to base two. ....., base two.

(55) If $\log_6 (5x - 4) = 3$, x = ...

(56) If the odds that it will rain are 5 to 7, what is the probability that it will rain? .....

(57) The smallest value of x so that $|4x - 3| \leq 5$ is .....

(58) ⅕ + ⅙ + 1/7 = ...

(59) If $\frac{a}{13}$ has a remainder of 12 and $\frac{b}{13}$ has a remainder of 11, $\frac{ab}{13}$ has a remainder of .....

*(60) $50 \times 60 \times 84 \times 7 =$ .....

(61) Change 210, base three, to base eight. ....., base eight.

(62) If $3^x - 2x^2 = x^2$, x = ...

(63) How many different 8 letter words, real or imaginary, can be constructed using the letters "x, y, z, z, a, z, b, z"? .....

(64) When two dice are tossed what is the probability that the difference of the faces is 4? .....

(65) The slope of the line parallel to $\frac{4x}{3} - \frac{3y}{2} = 1$ is .....

(66) If $f(x,y) = 2xy^2 - (x + 2y)$, $f(-1,2) =$ .....

(67) Find the x-intercept of the line containing the points (—1,3) and (0,2). .....

(68) If $f(x) = \frac{2x - 3}{4}$ and $f^{-1}(X) = ax + b$, b = ...

(69) The smallest value in the domain of x so that $f(x) = \sqrt{\frac{4x}{3} - 8}$ is a real-valued function is .....

*(70) 276080 ÷ 493 = ...

(71) The maximum value of $f(X) = 2x - 3x^2$ is .....

(72) The coefficient of the x^2y^6 term in the binomial expansion of $(\frac{x}{2} - y^2)^5$ is .....

(73) $\sin \frac{7\pi}{4} =$ .....

(74) The midpoint of the line segment with endpoints (—1,3) and (5,—3) is ..... (..... , ...) .....

(75) What is the slope of the line tangent to $y = 4x^3 - 3x + 2$ at x = —2? .....

(76) The discriminant of $2x - 3x^2 + 4 = 0$ is .....

(77) The vertical asymptote of $f(X) = \frac{x + 2}{x - 4}$ is x = ...

(78) The sum of the infinite geometric series $3 + 1 + ⅓ + 1/9 + 1/27 + \ldots$ is .....

(79) The second derivative of $f(X) = 4x^3 - 7X + 3$ is .....

*(80) $\int_2^8 (6x^5 - 3x^2)\, dx + 4 =$ .....

The University of Texas Interscholastic League

Number Sense Test, Series JJ-4

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

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Stop—Wait for Signal

(1) $31047 + 58934 =$ .....

(2) $10543 - 7658 =$ .....

(3) $3498 \times 7 =$ .....

(4) $5689 + 3678 + 36547 =$ .....

(5) $2015 - 2587 + 3489 =$ .....

(6) $91 \times 17 + 51 \times 3 =$ .....

(7) $25764 \div 57 =$ .....

(8) If $x - 1078 = 245$, $x =$ .....

(9) $4\frac{1}{6}\%$ of \$186 = \$.....

*(10) $570 + 267 + 561 + 935 + 587 =$ .....

(11) $39^2 =$ .....

(12) $5\frac{6}{7} \div 2\frac{13}{14} =$ .....

(13) $72 \times 65 =$ .....

(14) $\sqrt{3364} =$ .....

(15) $679 \times 11 =$ .....

(16) 17 pecks = ... qts.

(17) The average of 74, 85, 69 and 40 is .....

(18) The greatest common divisor of 189 and 198 is .....

(19) The least common multiple of 189 and 198 is .....

*(20) $350 \times 94 =$ .....

(21) The median of 91, 78, 87, and 96 is .....

(22) Change 145, base six, to base ten. .....

(23) Change 56, base ten, to base four. ....., base four.

(24) The area of a sphere with diameter 25 is a π and a = ...

(25) $9\ 5/7 - 3\frac{2}{3} =$ .....

(26) If 231 cu. in. equals 1 gallon, 12 gallons = ... cu. in

(27) $3.04 + 82.1 + 16\% =$ .....

(28) $(115)^2 =$ .....

(29) The product of the distinct prime divisors of 252 is .....

*(30) $9^5 - 9 =$ .....

(31) If an 8 lb. roast costs \$9.52, at the same price per pound, a 10 lb. roast will cost \$.....

(32) Which is smaller $\frac{31}{33}$ or $\frac{47}{50}$? .....

(33) Find the volume of a pyramid whose area of the base is 18 and whose height is 42. .....

(34) 402, base five, divided by 32, base five, = ..., base five.

(35) Solve for x: $2x + y = 0$, $2y + z = 0$, $2x + z = 3$, $x =$ .....

(36) The remainder when 18043 is divided by eleven is .....

(37) The mode of 17,11,15,12,22,12,11,19,12 is .....

(38) The radius of the circle $x^2 + y^2 - 10x + 8y = 8$ is .....

(39) Write as a common fraction: .945945 . . . .

*(40) $\sqrt{574564} + 2 =$ .....

(41) If $f(x) = 3(x^2 - 4) + 2x + 3$, $f(-3) =$ .....

(42) The remainder when 80269 is divided by 9 is .....

(43) The largest value of x such that $\frac{3x}{4} - 2x \geq 8$ is .....

(44) If $\log_4 (6x + 4) = 4$, $x =$ .....

(45) The sum of the roots of $\frac{-2x^2}{5} + 2x = 1$ is .....

(46) The product of the roots of $\frac{-2x^2}{5} + 2x = 1$ is .....

(47) If 12½ pesos equal one dollar, \$15.76 = ... pesos.

(48) Find the slope of a line perpendicular to $\frac{5x}{2} - 2y = 3$. .....

(49) If $8^x = 4096$, $x =$ .....

*(50) $20\frac{15}{22}$ miles = ... ft.

(51) Of 600 families, each of which either owns a home or car, who live in Austin 470 own a car and 350 own their home. How many families own both? .....

(52) The smallest value of x such that $|5x + 2| \leq 3$ is .....

(53) How many distinct positive prime divisors of 1225 are there? .....

(54) If 80 kph is the same speed as 50 mph, 75 mph = ... kph

(55) 7 gallons = ... oz.

(56) 153, base seven, minus 64, base seven = ..., base seven.

(57) What is the distance from the point (2,—1) to the point (—5,—1)? .....

(58) If $f(x,y) = 3xy - 4(x + y)$, $f(1,-2) =$ .....

(59) If x and y vary directly and $x = -2$ when $y = 3$, find x when $y = \frac{1}{2}$. .....

*(60) 70 acres = ... sq. rds.

(61) Three coins are tossed. What is the probability of obtaining exactly two tails? .....

(62) Find the x-intercept if a line contains the point (3,4) and the y-intercept is 2 .....

(63) $\sum_{i=0}^{6} \frac{1}{3}(i - 2) =$ .....

(64) If $90° \leq \theta \leq 180°$ and $\tan \theta = \frac{-\sqrt{3}}{2}$, $\theta =$ ..... degrees.

(65) How many seven letter words, real or imaginary, can be constructed using the letters "b,a,b,b,e,f,g"? .....

(66) If $\frac{a}{29}$ has a remainder of 17 and $\frac{b}{29}$ has a remainder of 11, $\frac{ab}{29}$ has a remainder of .....

(67) The remainder of $f(x) = 9x^2 - 3x^3 - 10$ divided by $x + 2$ is .....

(68) The midpoint of the line segment with endpoints (2,—3) and (4,1) is .....(.....,.....).....

(69) How many different 3-digit numbers can be formed from the digits 3,4,5,6,7,8 if repetition in a number is not allowed? .....

*(70) $80 \times 60 \times 93 \times 11 =$ .....

(71) If two cards are drawn, what is the probability they are of the same suit? .....

(72) What is the slope of the line tangent to $y = 5x^3 - 2x^2 - 6$ at $x = 2$? .....

(73) The discriminant of $2x - 5x^2 = -3$ is .....

(74) The maximum value of $f(x) = 3x - 2x^2$ is .....

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

(76) The second derivative of $f(x) = 3x - 2x^3$ is .....

(77) The sum of the infinite geometric series $2 + \frac{1}{3} + 1/18 + 1/108 + \ldots$ .....

(78) The horizontal asymptote of $f(x) = \frac{x - 1}{3x}$ is $y =$ .....

(79) Given a point (5,180°) in polar coordinates, find its rectangular coordinates. .....(.....,.....).....

*(80) If matrix A = [12, 14, 16] and matrix $B = \begin{bmatrix} 121 \\ 32 \\ -45 \end{bmatrix}$, AB = ...

The University of Texas Interscholastic League

Note: If error is found in this key, grading should be done by correct answer. The state office will appreciate a report of any error found.

Key to Number Sense Contest JJ-1

1. 11593
2. 1736
3. 825
4. 13
5. 3367
6. 122
7. 1/2
8. 36
9. 41/40 or 1 1/40
*10. 14174 - 15666
11. 629
12. 171
13. 512
14. 11 1/14 or 155/14
15. 48
16. 576
17. 41
18. 113, base six
19. 4752
*20. 46208 - 51072
21. 54
22. 50
23. $7.00
24. 513
25. 4225
26. $7.90
27. 14
28. 1012, base three
29. 87.5% or 87 1/2%
*30. 5476560 - 6053040
31. 12300 seconds
32. 1153, base nine
33. 40
34. 41/33
35. 0
36. .8 or 4/5
37. 500 pesos
38. –5
39. –2
*40. 501600 - 554400
41. 0
42. – 1/4
43. 21
44. 5994
45. 3
46. 44
47. 22/25
48. 36
49. 3121, base four
*50. 4275 - 4725
51. 95/126
52. 124, base five
53. 4800 grams
54. 1/6
55. – 7/2 or –3.5 or –3 1/2
56. – 1/4
57. 16
58. 60
59. 1/3
*60. 11,400 - 12,600 rds.
61. 5
62. 7/16
63. 25
64. –2
65. 1
66. 3
67. 12
68. 8
69. –2
*70. 4997 - 5523
71. – 5/12
72. –2
73. 72
74. 8
75. – 9/2 or –4 1/2 or –4.5
76. 81/16 or 5 1/16
77. 3/2 or 1 1/2 or 1.5
78. $\frac{-3}{7}\ \frac{-4}{6}$
79. 10
*80. 1463 - 1617

Key to Number Sense Contest JJ-2

1. 115151
2. 43124
3. 5138
4. 8870
5. 730
6. ~~3586~~ 3569
7. 82
8. 6
9. 1296
*10. 842479 - 931161
11. 585
12. 52
13. 743
14. 9.8 or 9 4/5 or 49/5
15. $9.20
16. 15/28
17. 18
18. 1512
19. 30%
*20. 111758 - 123522
21. 212, base five
22. 61
23. 12
24. 6446
25. 36
26. 45
27. 2025
28. $38.00
29. 1 5/18 or 23/18 hrs.
*30. 44840 - 49560
31. 123, base eight
32. 2128
33. 22/15
34. –3
35. 5217
36. 1
37. 3
38. –1
39. 5
*40. 6574 - 7266
41. 7
42. 27/31
43. 111000010, base two
44. 45
45. 18
46. 12
47. 19 lbs.
48. 59/70
49. 10
*50. 6078537 - 6718383
51. 8
52. –54
53. 49
54. 5
55. 24
56. 4/5
57. 1/12
58. 2
59. 21, base eight
*60. 6631 - 7329
61. 37
62. 9
63. 4
64. 1
65. 42
66. 30
67. 5/9 or 5 to 9
68. 9/4
69. 25/16 or 1 9/16
*70. 90288 - 99792 cu. in.
71. –11
72. –1
73. 56
74. 30
75. 28
76. –56
77. 0
78. –1
79. 8/3 or 2 2/3
*80. 48165 - 53235

Key to Number Sense Contest JJ-3

1. 90282
2. 43189
3. 10064
4. 584731
5. 7478
6. 274
7. 18 1/8 or 145/8
8. 2916
9. 6 8/15 or 98/15
*10. 43890 - 48510
11. 4524
12. 12/11 or 1 1/11
13. 6314
14. 374
15. 50
16. 36
17. 31
18. 14 lbs.
19. 111 9/16 or 1785/16
*20. 252358 - 278922
21. 22
22. 1386
23. 18/23
24. 3
25. 30
26. 58 1/2 or 58.5 or 117/2
27. 5625
28. 107
29. ~~1011~~, base three 22 11
*30. 249033 - 275247
31. 6
32. 15/4 or 3 3/4
33. $6.50
34. 160
35. 17/303
36. 58608
37. 204
38. 3522, base seven
39. 21
*40. 28785 - 31815 sec.
41. 2
42. 2
43. (3, –1)
44. 17/12 or 1 5/12
45. 7/8
46. 13
47. – 12/5 or –2 2/5 or –2.4
48. $15.20
49. 1
*50. 798 - 882
51. 120
52. .91
53. 65
54. 100011110, base two
55. 44
56. 5/12
57. – 1/2
58. 107/210
59. 2
*60. 1675800 - 1852200
61. 25, base eight
62. 3
63. 1680
64. 1/9
65. 8/9
66. –11
67. 2
68. 3/2
69. 6
*70. 532 - 588
71. 1/3
72. –5/2 or –2 1/2 or –2.5
73. $\frac{1}{-\sqrt{2}}$ or $-\frac{\sqrt{2}}{2}$
74. (2, 0)
75. 45
76. 52
77. 4
78. 9/2 or 4 1/2 or 4.5
79. 24x
*80. 248501 - 274659

Key to Number Sense Contest JJ-4

1. 89981
2. 2885
3. 24486
4. 45914
5. 2917
6. 1700
7. 452
8. 1323
9. $7.75
*10. 2774 - 3066
11. 1521
12. 2
13. 4680
14. 58
15. 7469
16. 136 qt.
17. 67
18. 9
19. 4158
*20. 31255 - 34545
21. 89
22. 65
23. 320, base four
24. 625
25. 127/21 or 6 1/21
26. 2772 cu. in.
27. 85.3
28. 13225
29. 42
*30. 56088 - 61992
31. $11.90
32. 31/33
33. 252
34. 11, base five
35. 1/2
36. 3
37. 12
38. 7
39. 35/37
*40. 722 - 798
41. 12
42. 7
43. – 32/5 or –6 2/5
44. 42
45. 5
46. 5/2 or 2 1/2 or 2.5
47. 197 pesos
48. – 4/5
49. 4
*50. 103740 - 114660 ft.
51. 220
52. –1
53. 2
54. 120 kph
55. 896 oz.
56. 56, base seven
57. 7
58. –2
59. – 1/3
60. 10640 - 11760
61. 3/8
62. –3
63. 7/3 or 2 1/3
64. 120 degrees
65. 840
66. 13
67. 50
68. (3, –1)
69. 120
*70. 4664880 - 5155920
71. 1/17
72. 52
73. 64
74. 9/8 or 1 1/8
75. 15
76. –12x
77. 12/5 or 2 2/5 or 2.4
78. 1/3
79. (–5, 0)
*80. 1121 - 1239