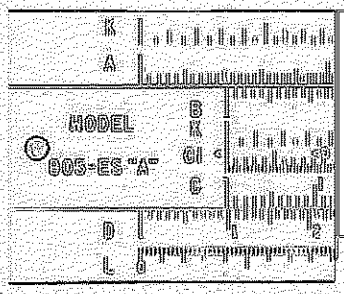
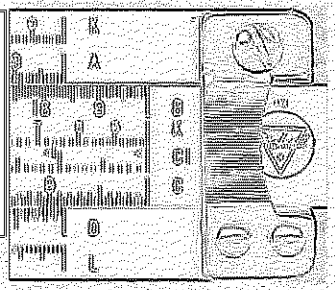
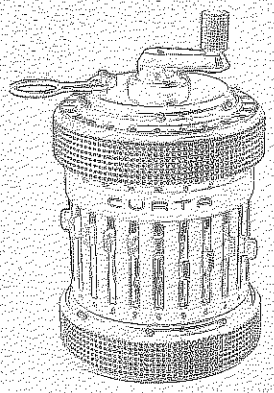
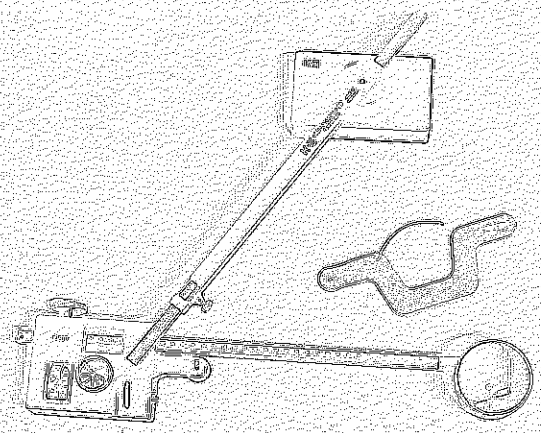


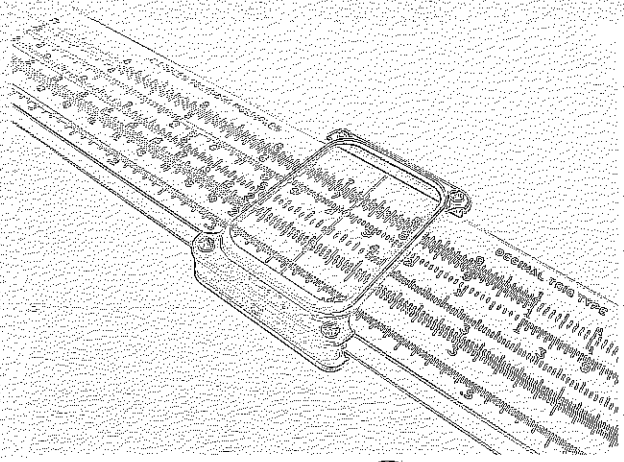
Texas Competitive Mathematics
Web - http://www.texasmath.org
Fax - (206) 666-MATH/(206) 666-6284
E-Mail - webmaster@texasmath.org

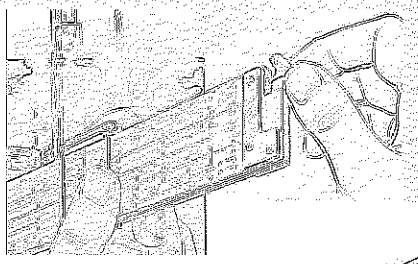


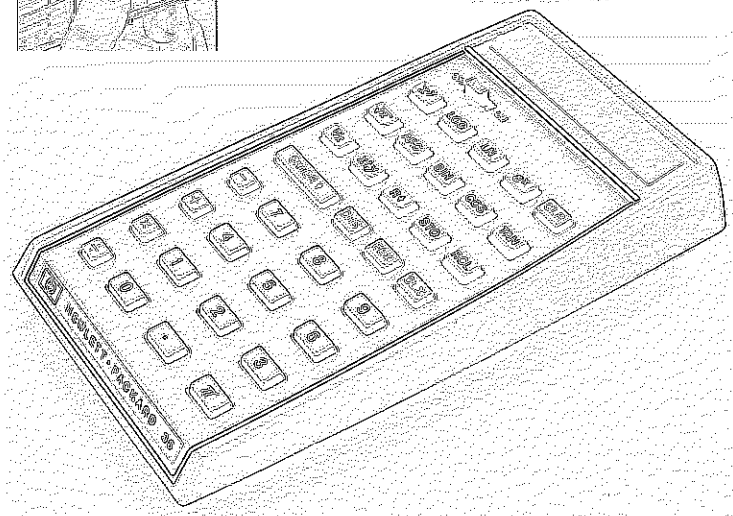
1971-72 UIL Number Sense
(14 pages)

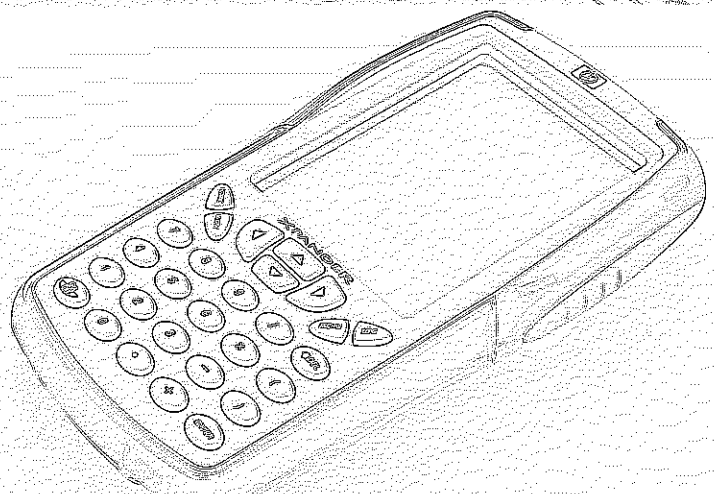


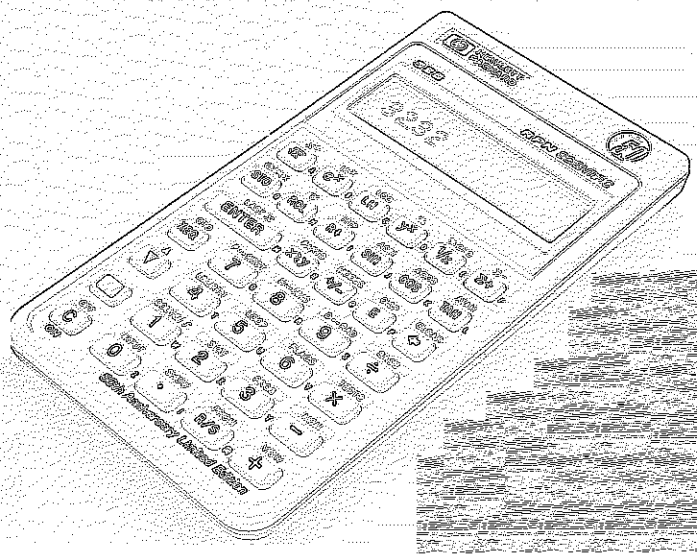


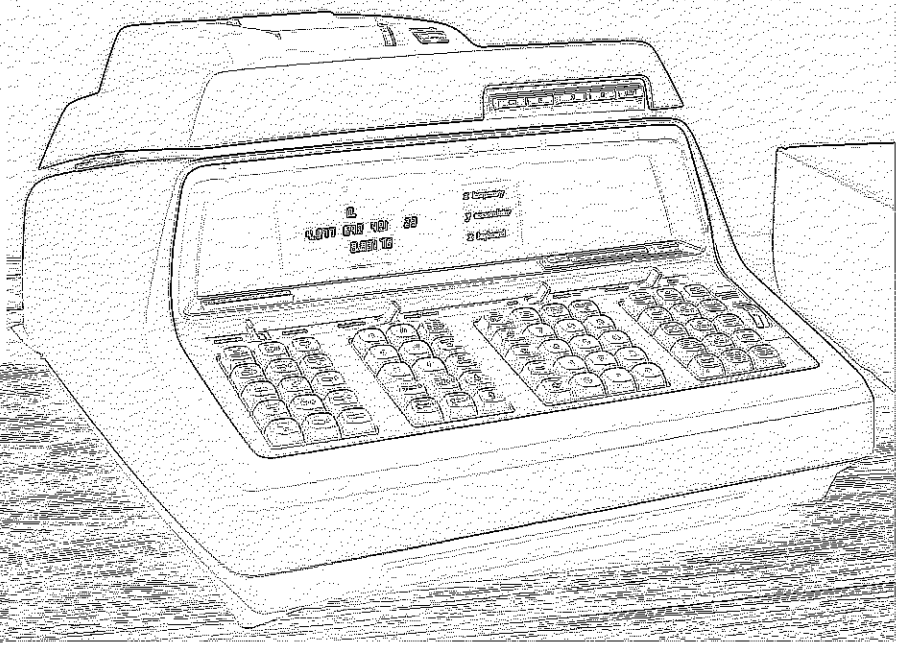












The University of Texas Interscholastic League

Number Sense Test, Series EE-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) $26 + 93 =$ .....

(2) $92 - 37 =$ .....

(3) $85 \times 85 =$ .....

(4) $36 \times 36 =$ .....

(5) $47 \times 53 =$ .....

(6) $22\ 2/9\% =$ ..... (fraction).

(7) $7\frac{1}{2} \times 24 =$ .....

(8) $3/11 =$ .....%.

(9) $46 + 52 - 27 =$ .....

*(10) $192 \times 179 + 132 =$ .....

(11) At $7 per front foot, it costs $4620 to pave a strip. The length of the strip is .....ft.

(12) If four times a number plus three times the number minus 5 equals 48, the number is .....

(13) $3\frac{1}{2} + 5\frac{2}{3} =$ .....

(14) $4\frac{2}{3} - 3\frac{5}{6} =$ .....

(15) If the second of three numbers is three times the first and the third is twice the second, and their sum is 80, the smallest is .....

(16) $2\frac{1}{2} \times 14 =$ .....

(17) Four times a number plus 32 is divided by 2 to give 30. The number is .....

(18) $3\frac{5}{6} + 2\frac{1}{3} =$ .....

(19) The sum of two numbers is 12. The first is one third the second. The second is .....

*(20) $8923 + 917 + 7856 + 304 =$ .....

(21) $2\frac{1}{2} \div 5 =$ .....

(22) At $3.25 each, how many shirts can be bought for $52? .....

(23) Find the shortest side of a triangle with perimeter 81" and two sides of 24" and 26". .....in.

(24) $2\frac{2}{3} + 3\ 1/6 - 2\ 1/6 =$ .....

(25) The average of $47\frac{1}{4}$, 46, $45\frac{1}{2}$, and 48 is .....

(26) If a Volvo car sells for 62500 pesos, the dollar equivalent price at 12.5 pesos per dollar is ..... dollars.

(27) $\frac{1}{2} + \frac{1}{3} + \frac{5}{6} =$ .....

(28) The area of a triangle with altitude $11\frac{1}{2}$" and base $6\frac{1}{2}$" is ..... sq. in.

(29) Which is greater 154/155 or 174/175? .....

*(30) $28080 \div 156 =$ .....

(31) $78^2 - 76^2 =$ .....

(32) 30% of 70% = ...%

(33) What is the cost of insuring a $40,000 house at $37\frac{1}{2}¢$ per hundred on .6 of its value? $.....

(34) The product of the positive integral divisors of 15 is .....

(35) $4\frac{1}{2}$ miles = ... yd.

(36) $.96 \times 8 =$ .....

(37) $11\ 1/9 \times 81 =$ .....

(38) $5.9 - 6.2 + .8 =$ .....

(39) The Cartesian product of {2, 1} by its power set contains ..... elements.

*(40) $5.3 \times 5.3 \times 5.3 + 1.123 =$ .....

(41) Counting those deceased, everyone has how many great-great-grandfathers? .....

(42) In a right triangle with sides 3, 4, and 5, the projection of the side 3 on the hypotenuse is .....

(43) Six men do a job in 9 days. At the same rate, how long will it take 9 men? ..... days.

(44) The product of the primes between 10 and 15 is .....

(45) $.05 \times 25.6 =$ .....

(46) $6 \times .8 + 12 \times .4 =$ .....

(47) The sum of the roots of $2x^2 + 3x - 5 = 0$ is .....

(48) The product of the roots of $2x^2 + 3x - 5 = 0$ is .....

(49) 468 sq. in. = ... sq. ft.

*(50) $83^2 + 3111 =$ .....

(51) The greatest common divisor of 30 and 105 is .....

(52) $(.9)^3 =$ .....

(53) 13 is what per cent greater than 9? .....%.

(54) Change 2013, base four, to base two. .....

(55) Each of 562 and 7 is in base eight. The product in base eight is .....

(56) If $\log_{10}N = -2$, then $N =$ .....

(57) The largest prime divisor of 261 is .....

(58) $(2 - i)(3 + i) =$ .....

(59) The diameter of a circle of area 25π is .....

*(60) $(19^2 + 18^2) \times 1500 =$ .....

(61) The slope of the line $3x + 2y = 9$ is .....

(62) The slope of the line through $(2, -1)$ and $(-3, 4)$ is .....

(63) 7 is what per cent less than 12? .....%.

(64) 5 is what per cent of 20? .....%.

(65) $18\frac{3}{4}$ is what per cent of 200? .....%.

(66) Write as a decimal 7/800. .....

(67) If $f(x) = x^2 - 3$ and $g(x) = 2x + 1$, then $f(g(3)) =$ .....

(68) If $x = ky$ and $x = 3$ when $y = 2$, find y when $x = 7$ .....

(69) The length of a tangent from a point 18′ outside a circle of radius 7′ is ..... ft.

*(70) $60{,}800 \div 19 =$ .....

(71) Find the radius of a circle with center at (2, 3) which passes through (5, 7) .....

(72) The y-intercept of $2x + 3y = 5$ is .....

(73) $37\frac{1}{2}\%$ of 108 = ...

(74) A holds 20% more than B which holds 20% more than C. A holds what per cent of C? .....

(75) If $a \div 6$ and $b \div 6$ give remainders of 2 and 3 respectively, find the remainder of $ab \div 6$ .....

(76) Write 1921 in Roman numerals .....

(77) Twenty-seven years from now, Joe's age in years will be three times his present age plus 5. His age is ..... yr.

(78) What fraction equals .626262 . . . ? .....

(79) What is the probability that four heads will come up when four coins are flipped? .....

*(80) $16(192 + 1728) =$ .....

The University of Texas Interscholastic League

Number Sense Test, Series EE-2

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 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 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.

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Stop—Wait for Signal

(1) $19 + 20 + 21 + 22 =$ .....

(2) $162 + 29 =$ .....

(3) $122 - 108 =$ .....

(4) $21 \times 22 =$ .....

(5) $392 \div 56 =$ .....

(6) $7 \times 8 + 3 \times 16 =$ .....

(7) $14 \times 14 =$ .....

(8) $75 \times 75 =$ .....

(9) $64 \times 56 =$ .....

*(10) $19^3 - 19^2 + 2 =$ .....

(11) $8\frac{1}{3}$ is what per cent less than $13\frac{1}{3}$? .....%.

(12) $2\frac{3}{5} + 2\frac{1}{4} =$ .....

(13) At what speed would you drive to cover $7\frac{1}{3}$ miles in 10 minutes? ..... m. p. h.

(14) An increase in speed of 100% is accompanied by a decrease in time of .....%.

(15) The square root of $63 \times 175 =$ .....

(16) The square root of $(25 + 144)$ is .....

(17) $3\frac{1}{2} + 2\frac{4}{5} =$ .....

(18) $3\frac{2}{3} \times 12 =$ .....

(19) A ball is taken at random from a sack containing 18 red, 17 blue, and 35 green ones. The probability that it is red is .....

*(20) $18\ (19^3 + 19^2) =$ .....

(21) A card is drawn at random from a deck of 52 playing cards. The probability that it is a face card is .....

(22) $2\frac{1}{2} + 3\frac{5}{6} - 1\frac{1}{4} =$ .....

(23) $2\frac{2}{3} \div 3/16 =$ .....

(24) $\frac{1}{2} \times 5 + \frac{2}{3} \times 6 =$ .....

(25) The perimeter of an equilateral triangle of area $441\sqrt{3}$ sq. ft. is ..... ft.

(26) The diameter of a circle of area 196π is .....

(27) The largest integer less than 1000 which is relatively prime to 1000 is .....

(28) If A is 30% more than B which is 25% more than C, then A is what per cent more than C? .....%.

(29) Which is greater 27/29 or 50/53? .....

*(30) $(15 - 1)(15^2 + 15 + 1) + 26 =$ .....

(31) A five tooth gear meshes with a seven tooth gear. How many revolutions does the 7 tooth one turn when the 5 tooth one revolves 21 times? .....

(32) The area of an isosceles right triangle of hypotenuse 30′ is .....

(33) The smallest prime greater than 2×51 is .....

(34) The number of positive integral divisors of $3 \times 2 \times 5$ is .....

(35) The sum of the positive integral divisors of $3 \times 2 \times 5$ is .....

(36) $8.9 \times .9 =$ .....

(37) $7.9 - .62 + 3.4 =$ .....

(38) $18\ 2/11 \times 44 =$ .....

(39) How many positive integers less than $2^2 \times 3 \times 5$ are relatively prime to $2^2 \times 3 \times 5$? .....

*(40) $21^2 + 31^2 + 41^2 + 17 =$ .....

(41) Chords A and B intersect in a circle so that the segments of A are 7′ and 8′. If one segment of B is 14′, the other is ..... ft.

(42) $.05\ (1.05 + .95) \div 2 =$ .....

(43) The square root of 5625 is .....

(44) What is the closest the centers of two tangent circles of areas 144π and 169π can be? .....

(45) If the cube of Tom's age plus 3 yr. is ten times his age in years and his age in years is an integer, then his age is ..... yr.

(46) If $1/x^2 = 289$ and $x > 0$, then $x =$ .....

(47) If the dimensions of a solid are all multiplied by three, the volume is multiplied by .....

(48) If P is the power set for {4, 5, 6} and Q is the power set for {1, 2, 3}, then P × Q contains ..... elements.

(49) 1800 eggs = ... doz.

*(50) $83^2 + 3111 =$ .....

(51) $(.8)^3 =$ .....

(52) 26 is what per cent greater than 22? .....%.

(53) If 10 men do a job in 63 days, at the same rate, 12 men can do it in ..... days.

(54) The largest prime, the sum of whose digits is 4, is .....

(55) If x and y are each positive integers such that $15x = 18y$, the smallest possible value of x is .....

(56) The product of the roots of $7x^2 - 3x + 5 = 0$ is .....

(57) The sum of the roots of $7x^2 - 3x + 5 = 0$ is .....

(58) The least common multiple of 39 and 51 is .....

(59) The greatest common divisor of 39 and 51 is .....

*(60) 25% of 87½% of 21,600 = ...

(61) If 246 and 66 are in base seven, give their sum in base seven .....

.....

(62) Change 542, base six, to base 10. .....

(63) How many primes are between 100 and 110? .....

(64) The smaller root of $3x^2 + 5x + 2 = 0$ is .....

(65) Find the smallest integer x such that $x/-2 + 3 < -7$ .....

(66) Write as a common fraction .323232 . . . .

(67) If $i^2 = -1$, write $2/(2-3i)$ in the form $a + bi$ with a, b real.

.....

(68) If $\log_2 A = 3$ and $\log_2 B = 4$, then $\log_2 AB =$ .....

(69) The greatest common divisor of 0 and 127 is .....

*(70) $(60{,}800 \div 19) \times 11 =$ .....

(71) If $F = 9/5\ C + 32$ and $C = 40$, then $F =$ .....

(72) Find K so (k, 12), (4, 6) and (2, 8) lie on the same line.....

(73) How many committees of 3 members each can be formed from 5 people? .....

(74) Out of 120 people, exactly 82 drank coffee and 49 drank tea. Each person drank coffee or tea. How many drank both? .....

(75) If the difference of two numbers is 5 and the difference of their squares is 65, the smaller number is .....

(76) 11/40 = ... (decimal).

(77) The next term of 1, 1, 3, 5, 9, 15, 25, . . . is .....

(78) $\frac{7\pi}{5}$ radians = ...°.

(79) $125 \times 135 =$ .....

*(80) $5\% \times 89694 - 15 =$ .....

The University of Texas Interscholastic League
Number Sense Test, Series EE-3

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

Read Directions Carefully Before Beginning Test

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Stop—Wait for Signal

(1) $23 + 24 + 25 + 26 =$ .....

(2) $106 + 107 =$ .....

(3) $153 - 29 =$ .....

(4) $31 \times 32 =$ .....

(5) $392 \div 7 =$ .....

(6) $7 \times 9 + 4 \times 18 =$ .....

(7) $16 \times 16 =$ .....

(8) $65 \times 65 =$ .....

(9) $74 \times 66 =$ .....

*(10) $(21^3 - 21^2)\ 16 =$ .....

(11) The square root of $21 \times 84 =$ .....

(12) The square root of $6^2 + 8^2 =$ .....

(13) $3\frac{2}{5} + 2\frac{3}{5} =$ .....

(14) $5\frac{1}{5} - 3\frac{4}{5} =$ .....

(15) The perimeter of a square of area $6\frac{1}{4}$ sq. in. is ..... in.

(16) The interest on \$8800 at 6% is \$ .....

(17) At what rate should \$8000 be invested in order to yield \$500 per yr.? .....%.

(18) Find the tax on 15,000,000 gal. gasoline at 9¢ per gal. \$ .....

(19) Of 425 students, 142 take English, 137 take science, and 221 take neither. How many take both? .....

*(20) $17(21^3 + 21^2 - 2) =$ .....

(21) $2\frac{1}{3} + 3\frac{4}{5} =$ .....

(22) $2\frac{2}{3} \times 18 =$ .....

(23) $\frac{2}{3} \times \frac{1}{2} + \frac{3}{5} \times 10/3 =$ .....

(24) $2\frac{2}{3} + 3\frac{1}{2} + 4\frac{5}{8} =$ .....

(25) $\frac{2}{3} \times \frac{3}{4} + \frac{3}{5} \times 5/2 =$ .....

(26) Find the area of a right triangle with hypotenuse 50″ and one side 48″. ..... sq. in.

(27) How far can one drive in 4 hours 50 minutes at 66 miles miles per hour? ..... mi.

(28) Circle A has a radius of $1\frac{1}{2}$″ and the radius of circle B is 3″. The area of B is what per cent more than that of A? .....%.

(29) Triangle A has base 30″ and altitude 123″ while triangle B has base 30″ and altitude 150″. The area of A is what per cent less than that of B? .....%.

*(30) $9962 + 7852 + 6531 + 655 =$ .....

(31) $8.7 \times 6 =$ .....

(32) $.95 + 8.4 - 6.2 =$ .....

(33) $6.2\frac{1}{2} \times 24 =$ .....

(34) $2\frac{1}{2}$ is the fourth root of .....

(35) The probability that one head and one tail will show on the flip of two coins is .....

(36) $56^2 - 44^2 =$ .....

(37) If the perimeter of a square changes from 4 in. to 20 in., the area is multiplied by .....

(38) $13^3 - 12^3 =$ .....

(39) How many minutes are from 10:30 PM to 6 AM the next morning? ..... min.

*(40) $127 \times 123 + 379 =$ .....

(41) $1/20\ (1.05 + .95) =$ .....

(42) $\sqrt[3]{.216} =$ .....

(43) The greatest common divisor of 6, 18, 42 is .....

(44) If $2^x = \frac{1}{8}$, then $x =$ .....

(45) The remainder when 818×78 is divided by 6 is .....

(46) $23 \times 25 - 24 \times 24 =$ .....

(47) How many positive integral divisors does 40 have? .....

(48) The largest prime divisor of 52^3 is .....

(49) Find the remainder: $[17^2 + (3 \times 17) + 4] \div 13$ .....

*(50) $26\ (1 + 2 + 2^2 + 2^3 + 2^4 + 2^5 + 2^6 + 2^7) =$ .....

(51) If 6 hens lay 20 eggs in 5 days, at the same rate how many eggs will 5 hens lay in 12 days? ..... eggs.

(52) A tangent from P to a circle is 4″, while a secant from P intersects the circle at A and B with A between P and and B so that PA = 2″. Then PB = ... in.

(53) The perimeter of an equilateral triangle of area 36 $\sqrt{3}$ sq. in. is ..... in.

(54) How many ordered pairs are in the set $\{1, 2\} \times \{1, 3, 4\}$? .....

(55) If the ratio of the volumes of two similar cones is 27/8, then the ratio of their slant heights is .....

(56) How many gallons of water must be added to 16 gallons of a 10% solution to make one of 8%? ..... gal.

(57) How many sets of two elements may be selected from a set of 4 elements? .....

(58) $(1.7)^2 =$ .....

(59) 27 is what per cent greater than 20? .....%.

*(60) 42840 ÷ 238 = ...

(61) Write the largest number less than every number of the sequence: 1, ⅛, ⅛, 1/7, ...

(62) 11 is what per cent less than 20? .....%.

(63) 35% of 90 = ...

(64) The area of a triangle whose sides are 12′, 10′, 10′ is ..... sq. ft.

(65) The area of a triangle of sides 14″, 48″, and 50″ is .....sq. in.

(66) How many degrees are in each central angle of a regular heptagon (7 sides)? .....°.

(67) If $3x + 4 = -2$, then $|x| =$ .....

(68) $155 \times 155 =$ .....

(69) How many integers less than or equal to 36 are relatively prime to 36? .....

*(70) $187.5 \times 19240 =$ .....

(71) How many positive integral divisors does 56 have? .....

(72) The sum of the positive integral divisors of 56 is .....

(73) The least common multiple of 27, 63, and 21 is .....

(74) 30 = 6/11 of .....

(75) At 100 mi. per hr., I am traveling ..... ft. per sec.

(76) The greatest common divisor of 13225 and 225 is .....

(77) Write MDCXXIV in ordinary base 10: .....

(78) 44 4/9 is to 55 5/9 as 8 is to .....

(79) What is the smallest positive integral number of 77 lb. bags that will balance some positive integral number of 66 lb. bags?.....

*(80) (188 + 288 + 388 + 488)10 =.....

The University of Texas Interscholastic League

Number Sense Test, Series EE-4

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

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Stop—Wait for Signal

(1) $27 + 28 + 29 + 30 =$ .....

(2) $105 + 119 =$ .....

(3) $227 - 39 =$ .....

(4) $27 \times 29 =$ .....

(5) $116 \div 16 =$ .....

(6) $6 \times 15 + 3 \times 30 =$ .....

(7) $39 \times 39 =$ .....

(8) $95 \times 95 =$ .....

(9) $73 \times 67 =$ .....

*(10) $1927 + 358 + 7250 + 465 =$ .....

(11) At .621 mi. per kilo., 1863 mi. = ... kilo.

(12) If a commodity costs 35¢ per lb. and the overhead is 37½%, how much will a man make on 800 lb. if he sells at 60¢ per lb. $.....

(13) If Tom's salary is $1200 per mo. and takeouts are 12½% income tax, 4% social security, and $24 per mo. insurance, his net monthly check is $ .....

(14) $3\frac{3}{8} \div 2\ 7/10 =$ .....

(15) $2\frac{3}{8} - 1\ 7/10 =$ .....

(16) $3\frac{3}{8} \times 15 =$ .....

(17) $2\frac{3}{8} + 3\ 7/10 - 2\frac{2}{8} =$ .....

(18) At 7½ gal. per cu. ft., a 3′ × 5′ × 4′ bin contains ..... gal.

(19) The sum of the positive integral divisors of 100 is .....

*(20) $\frac{3}{8} \times 16200 + \frac{7}{8} \times 32400 =$ .....

(21) $2\frac{2}{3} \div 8 =$ .....

(22) $2\frac{1}{2} \times 3\frac{1}{8} =$ .....

(23) $\frac{2}{3} \times \frac{3}{8} + 3/7 \times 7/9 =$ .....

(24) $2^3 \times 5 \times 2 \times 5^3 =$ .....

(25) The largest prime divisor of 222 is .....

(26) How many positive integers less than 120 are relative prime to 120? .....

(27) How many positive integers less than or equal to 120 are relative prime to 120? .....

(28) The product of the greatest common divisor and least common multiple of 56 and 12 is .....

(29) The number of elements in the power set for {2, 3} × {3, 4, 5} is .....

*(30) $\frac{7}{8} \times 32400 - \frac{3}{8} \times 16200 =$ 3240

(31) If $(9/4)^x = \frac{2}{3}$, then x = ...

(32) The smallest perfect square greater than 500 is .....

(33) If $3x + 2 \geqq x - 6$, the smallest possible value for x is .....

(34) The coefficient of the a^2b term of $(a + 3b)^3$ is .....

(35) If $2x + 3y = 5$ and $2x - 5y = 7$, then y = ...

(36) $9.4 \times .8 =$ .....

(37) $5.2 + 4.5 - 8.4 =$ .....

(38) $66\frac{2}{3} \times 96 =$ .....

(39) The sum and difference of the perimeters of two squares are 60 and 48 respectively. The difference of their areas is .....

*(40) $18^4 + 24 =$ .....

(41) If the area of a rhombus is 84 and one diagonal is 7, the other is .....

(42) $12 + 18 + 24 + 30 + 36 =$ .....

(43) $8.2(.5 + 1) =$ .....

(44) The cube root of .729 is .....

(45) Articles weighing 4/3 oz. each sell for $3.00 per lb. At this rate 1 doz of them sell for $ .....

(46) If 10 liters are equivalent to 2.64 gallons, then 25 liters are equivalent to ..... gal.

(47) At 12½ pesos per dollar, 40 gal. gas costing 30¢ per gal. costs a total of ..... pesos.

(48) How far can one drive at 55 miles per hour in 12½ hours? ..... mi.

(49) If B holds 20% more than A and C holds 35% more than A, then C holds what per cent more than B? .....%.

*(50) The volume of a circular cylinder of radius of $75 \div \sqrt{\pi}$ ft. and height of 64 ft. is ..... cu. ft.

(51) $(.6)^3 =$ .....

(52) 55 5/9% of 198 = ...

(53) A car moving 90 miles per hour is moving ..... ft. per sec.

(54) At the above rate it will take the car how many seconds to go 330 ft? .....

(55) The square root of 98×50 is .....

(56) The square root of $2^2 + 3^2$ is .....

(57) Everyone ordered either steak or fish. Of 144 people, 98 ordered steak and 56 ordered fish. How many ordered both? .....

(58) A triangle has sides of 22", 20", and 18". Its area is ..... sq. in.

(59) The area of a square increased from 81 to 121. The increase in perimeter was .....

*(60) The sum of the squares of the primes less than or equal to 20 is .....

(61) 220 is what per cent greater than 198? .....%.

(62) 165 is what per cent less than 198? .....%.

(63) How many days are there from Jan. 1, 1964, to Apr. 1, 1964? ..... days.

(64) How many elements are in the power set for $\{1, 3\} \cup \{1, 2, 4\}$? .....

(65) How many elements are in the Cartesian product set of the power set for {1, 3} by the power set for {4, 5, 6}? .....

(66) Find the remainder: $(65 + 6 \times 7 - 83) \div 4$. .....

(67) The largest prime divisor of 529 is .....

(68) The least common multiple of 12, 18, 25 is .....

(69) The greatest common divisor of 12, 18, 25 is .....

*(70) $89 \times 56728 + 8 =$ .....

(71) The product of the three solutions of $x^3 - 5x^2 + 7x - 9 = 0$ is .....

(72) The sum of the three solutions of $x^3 - 5x^2 + 7x - 9 = 0$ is .....

(73) The sum of the products of the solutions of $x^3 - 5x^2 + 7x - 9 = 0$, taken two at a time is .....

(74) The sum of the positive integral divisors of 45 is .....

(75) The number of positive integral divisors of 45 is .....

(76) A line through the center of a circle bisects a 24 inch chord which is 5 inches from the center. The radius is ..... in.

(77) The ratio of the areas of two similar triangles is 9/4. The ratio of their altitudes is ..... (greater than one).

(78) The length of the tangent from a point 25 inches from the center of a circle of radius 7 is ..... in.

(79) $81 \times 78 =$ .....

*(80) $24^3 + 76 =$ .....

The University of Texas Interscholastic League
Number Sense Test, Series EE-5

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 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 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) $32 + 32 + 35 =$ .....

(2) $87 + 16 =$ .....

(3) $67 - 23 =$ .....

(4) $16 \times 18 =$ .....

(5) $156 \div 13 =$ .....

(6) $3 \times 27 + 2 \times 27 =$ .....

(7) $18 \times 18 =$ .....

(8) $85 \times 85 =$ .....

(9) $82 \times 78 =$ .....

*(10) $88 \times 75 + 92 \times 15 =$ .....

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

(12) $2\ 7/10 - 1\frac{2}{5} =$ .....

(13) $6\frac{2}{3} \times 36 =$ .....

(14) $3\frac{1}{2} \div 10\frac{1}{2} =$ .....

(15) How long is it from Jan. 1, 1965, to April 1, 1965? ..... days.

(16) How many elements are in the power set of $\{2, 3\} \times \{4, 5, 6\}$? .....

(17) The remainder when 652,987 is divided by 11 is .....

(18) The number of positive integral divisors of 78 is .....

(19) The sum of the positive integral divisors of 78 is .....

*(20) $8732 + 9628 + 1325 + 15 =$ .....

(21) The greatest common divisor of 12, 63, 49 is .....

(22) The least common multiple of 6, 21, and 14 is .....

(23) If the two integers have a sum of 12 and a product of 35, the smaller is .....

(24) $3\frac{3}{4} \times 60 =$ .....

(25) $3\frac{1}{6} + 2\ 4/7 - 2\ 5/7 =$ .....

(26) $\frac{3}{5} \times 10/9 - \frac{2}{3} \times \frac{5}{6} =$ .....

(27) The number of positive integers less than or equal to 22 and relatively prime to 22 is .....

(28) Find the cost of 1 gal. if 18 quarts cost $3.24. $.....

(29) The smallest fraction greater than each of: .6, .66, .666, .6666, . . . is .....

*(30) $(433{,}251 \div 529) + 1 =$ .....

(31) Find Keith's age in years if three times his age plus 7 years equals 25 years ..... yr.

(32) How many gallons of water must be added to 200 gal. of a 20% solution to make a $16\frac{2}{3}\%$ solution? ..... gal.

(33) $\sqrt{5625} =$ .....

(34) Find the perimeter of an equilateral triangle of area $25\sqrt{3}$ .....

(35) Two radii of a circle make an angle of 72°. The ratio of the area of small sector between them to that of the circle is .....

(36) $8.9 - .88 + 1.2 =$ .....

(37) $8.7\frac{1}{2} \times 56 =$ .....

(38) Add 16 base seven to 36 base seven and give answer, base seven .....

(39) Subtract 16 base seven from 35 base seven and give answer, base seven .....

*(40) $87 \times 29 \times 91 + 7 =$ .....

(41) If $15/x = x/375$ and $x < 0$, then $x =$ .....

(42) Each exterior angle of a regular octagon contains ..... degrees.

(43) If 15 men can do a job in 10 days, at the same rate, how many can do it in 3 days? .....

(44) $.9(85 + 75) =$ .....

(45) $\sqrt{5.29} =$ .....

(46) If I am twice as old as I was 29 years ago, my age is ..... yr.

(47) If the moon makes 27 revolutions in 28 days, how much later does it come up each day? ..... min.

(48) 100 A. of cotton would have made one-half bale per acre, but boll weevils cut the yield by $37\frac{1}{2}\%$. The actual total yield was ..... bales.

(49) What is the dollar value of 62.5 pesos at 12½ pesos to the dollar? ..... dollars.

*(50) $(19)^3 + 10^3 + 41 =$ .....

(51) At 1.61 kilo. per mile, how fast am I going when traveling 161 kilo. per hour? ..... mi. per hr.

(52) $78 \times 78 =$ .....

(53) $(2.9)^2 =$ .....

(54) 21 is what per cent of 350? .....%.

(55) Find the smallest two digit integer such that the sum of its digits is 8 and the product is 12. .....

(56) If $2^{x-y} = 2$ and $2^{x+y} = 64$, then $x =$ .....

(57) The side of an equilateral triangle of area $9\sqrt{3}$ is .....

(58) The number of degrees in each interior angle of a regular octagon is ..... degrees.

(59) The side of a regular hexagon of area $54\sqrt{3}$ is .....

*(60) $5(8 \times 9 + 18 \times 19 + 2 \times 43) =$ .....

(61) A line parallel to the base of a triangle cuts a side so that the part next to vertex is twice the other part. The area of the triangle cut off is what part of the whole? .....

(62) If $5x - 7 = 2 + 3x$, then $x =$ .....

(63) If prices go up 20%, then 10%, the advance on a $120 item is $ .....

(64) The largest integer less than 53 which is a prime is .....

(65) 6% of 350 = ...

(66) 420 is what per cent greater than 350? .....%.

(67) The sum of the positive integral divisors of $2^2 \times 13^2$ is .....

(68) The largest positive integral divisor of $2^2 \times 47$ which is less than $2^2 \times 47$ is .....

(69) The least common multiple of 45 and 75 is .....

*(70) 291,840 ÷ 1824 = ...

(71) The number of subsets with exactly three elements in a set with four elements is .....

(72) If 6 men do a job in 15 days, how long will it take 9 men? ..... days.

(73) $13 \times 97 =$ .....

(74) 180 is what per cent less than 450? .....%.

(75) Box A holds 30% more than B which holds 30% more than C. A holds what per cent more than C? .....%.

(76) The Cartesian product of the null set by {1,2} contains ..... elements.

(77) If 13 and 23 are in base four, their sum in base 4 is .....

(78) A bus travels 150 mi. in 2 hr. 15 min. Its average rate is ..... mi. per hr.

(79) The larger root of $x^2 - 9x + 14$ is .....

*(80) 10(12½% of 87½% of 2048) = ...

The University of Texas Interscholastic League

Number Sense Test, Series EE-6

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 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 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) $819 + 527 =$ .....

(2) $119 - 87 =$ .....

(3) $16 \times 12 =$ .....

(4) $52 \div 13 =$ .....

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

(6) $6\frac{1}{3} - 2\frac{5}{8} =$ .....

(7) $6\frac{1}{4}\%$ of \$192 = ...

(8) $28\ 4/7\% =$ ..... (fraction).

(9) $125 \times 125 =$ .....

*(10) $819 \times 723 + 63 =$ .....

(11) Change 213 base 4 to base 2: .....

(12) The cube root of 512 is .....

(13) Your club won 75% of their games and tied none. They played 64 games. They lost .....

(14) The product, base eight, of 177, base eight, by 7, base eight, is .....

(15) $\text{Log}_a a^3 =$ .....

(16) $\text{Log}_a(a^2 \cdot a^3) =$ .....

(17) $.373737 \ldots =$ ..... (fraction).

(18) If each of 9, 11, 13, 21 is in base 10, their sum, base 12, is .....

(19) The sum of the positive integral divisors of 96 is .....

*(20) $82 + 29 + 22 =$ .....

(21) T^2 varies inversely with S. T is 2 when S is 36. T is positive. Find T when S is 144. .....

(22) How much will a gallon of jam cost at 85¢ per pint? \$ .....

(23) The positive geometric mean between 4 and 9 is .....

(24) The angle supplementary to 97°20′ is .....° .....′.

(25) How many different committees of 4 members each can be formed from 5 members? .....

(26) The greatest common divisor, g. c. d., of 20, 18, 63 is .....

(27) The least common multiple, l. c. m., of 20, 18, 63 is .....

(28) The product of the g. c. d. and l. c. m. of 20, 18, 9 is .....

(29) The sum of the roots of $7x^2 - 9x + 5 = 0$ is .....

*(30) $9872 + 1279 + 349 + 700 =$ .....

(31) The product of the roots of $7x^2 - 9x + 15 = 0$ is .....

(32) The Cartesian product of {1,2} by {1,2,3} contains ..... elements.

(33) A glass 2 in. high holds 1 oz. A similar glass 8 in. high holds ..... oz.

(34) The probability that exactly two heads come up when 3 coins are tossed is .....

(35) Write $1 \div (2 - 3i)$ in the form $a + bi$, with a and b rational: .....

(36) Write 7/40 as a decimal: .....

(37) Write the value of the positive number k so that the roots of $x^2 - x + 9 = 0$ are equal. .....

(38) The length of the line segment from (2,5) to (7,10) is .....

(39) The slope of the above line is .....

*(40) $778{,}050 \div 819 =$ .....

(41) The slope of the line $2x - 3y = 7$ is .....

(42) $28 \times 28 =$ .....

(43) The center of the circle $x^2 + 4x + y^2 - 4y = 28$ is (.....,.....).

(44) The radius of the above circle is .....

(45) If $f(x) = x^2$ and $g(x) = x + 5$, then $f(g(7)) =$ .....

(46) If $f(x) = x^2$ and $g(x) = x + 5$, then $g(f(7)) =$ .....

(47) The next term of 1, 3, 3, 5, 7, 11, 17, . . . is .....

(48) $79 \times 79 =$ .....

(49) 1 day = ... min.

*(50) $18^3 + 21^3 + 7 =$ .....

(51) The altitude on the side 5 of a 3, 4, 5 right triangle is .....

(52) Write CDXLIV in base 10: .....

(53) If 51 is in base 7, then its square root, base 7, is .....

(54) If sin A= ½, and A is in second quadrant, then A = ...°.

(55) If sin A = ⅓ and A is in second quadrant, the cot A = ...

(56) The midpoint of the line through (2,7) and (9,3) is (.....,.....).

(57) Reduce 119/133 to lowest terms: .....

(58) The sum of the positive integral divisors of $3^2 \times 7 \times 2$ is .....

(59) The number of positive integral divisors of $3^2 \times 7 \times 2$ is .....

*(60) $(819 + 217)42 + 88 =$ .....

(61) The number of integers less than or equal to 95 and relatively prime to 95 is .....

(62) Write the first four non-zero digits of the decimal for 92/99: 0. .....

(63) $87 \times 87 =$ .....

(64) $96 \times 84 =$ .....

(65) $32 \times 37 + 18 \times 37 =$ .....

(66) 18¾% of 48 = ...

(67) $7 + 14 + 21 + 28 + 35 =$ .....

(68) The smallest integer greater than or equal to any of: 3, 3½, 3¾, 3⅞, . . . is .....

(69) The greatest integer less than or equal to 9π is .....

*(70) (189% of 7256) + 6.16 = ...

(71) If a = .676767 . . . is in base 8, then a = ... (fraction).

(72) The sum of the interior angles of a regular nine-sided figure is .....°.

(73) The sum of the exterior angles of the above figure is .....°.

(74) The largest prime divisor of 1331 is .....

(75) If $x^{-3/2} = 8$, then x = ...

(76) If $2^{x^2+x} = 8$, the largest such x is .....

(77) If 19 men do a job in 7 days, it will take how many to do it in 91 days? .....

(78) How many gallons of water must be added to 18 gal. of a 50% solution to turn it into a 33⅓% solution? ..... gal.

(79) A car marked $2200 was discounted 10% and then 10% again. The final price was $ .....

*(80) $[(829 \times 829 - 9) \div 26] + 68 =$ .....

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.

Answer Key
Number Sense Test EE-1

1. 119
2. 55
3. 7225
4. 1296
5. 2491
6. 2/9
7. 180
8. 27 3/11%
9. 71
10. 32,775–36,225
11. 660 ft.
12. 7 4/7
13. 9 1/6
14. 5/6
15. 8
16. 35
17. 7
18. 6 1/6
19. 9
20. 17,100–18,900
21. 1/2
22. 16
23. 24 in.
24. 3 2/3
25. 46 11/16 or 46.6875
26. 5000 dollars
27. 1 2/3
28. 37 3/8 sq. in
29. 174/175
30. 171–189
31. 308
32. 21%
33. 990
34. 225
35. 7920 yd.
36. 7.68
37. 900
38. .5
39. 8
40. 142.5–157.5
41. 6
42. 1 4/5
43. 6 days
44. 143
45. 1.28
46. 2.6
47. —3/2
48. —3/2
49. 3 1/4 sq. ft.
50. 9,500–10,500
51. 15
52. .729
53. 44 4/9%
54. 10,000,111
55. 5026
56. .01
57. 29
58. 7–L
59. 10
60. 976,125–1,073,875
61. —3/2
62. —1
63. 41 2/3%
64. 25%
65. 9 2/3%
66. .00675
67. 46
68. 4 2/3
69. 24 ft.
70. 3040–3360
71. 5
72. 5/3
73. 40 1/2
74. 144%
75. 0
76. MCMXXI
77. 11 yr.
78. 61/99
79. 1/16
80. 29,184–32,256

Answer Key
Number Sense Test EE-2

1. 82
2. 191
3. 14
4. 462
5. 7
6. 104
7. 196
8. 5625
9. 3584
10. 6175–6825
11. 37 1/2%
12. 4 17/20
13. 44 mi. per hr.
14. 50%
15. 105
16. 13
17. 6 3/10
18. 44
19. 9/35
20. 123,462–136,458
21. 4/13 5/13
22. 5 1/12
23. 128/9 or 14 2/9
24. 6 1/3
25. 126 ft.
26. 23
27. 999
28. 62 1/2%
29. 80/33
30. 3230–3570
31. 15
32. 225 sq. ft.
33. 108
34. 8
35. 72
36. 3.01
37. 10.68
38. 300
39. 16
40. 2945–3255
41. 4 ft.
42. 1/20 or .05
43. 75
44. 1
45. 3 yr.
46. 1/17
47. 27
48. 64
49. 150 doz.
50. 9,500–10,500
51. .512
52. 18 2/11%
53. 52 1/2 days
54. 31
55. 6
56. 5/7
57. 3/7
58. 563
59. 3
60. 4483.75–4961.25
61. 245
62. 206
63. 4
64. —1
65. 21
66. 33/99
67. 4/13 + 6/13i
68. 7
69. 127
70. 32440–36960
71. 104
72. —2
73. 10
74. 11
75. 4
76. .275 or .27 1/2
77. 41
78. 252°
79. 16,875
80. 497,040–549,360

Answer Key
Number Sense Test EE-3

1. 98
2. 213
3. 124
4. 992
5. 56
6. 135
7. 256
8. 4225
9. 4384
10. 134,064–148,176
11. 42
12. 10
13. 6
14. 1 2/5
15. 10 in.
16. $528
17. 6.25% or 6 1/4%
18. $1,350,000.
19. 75
20. 156,655–173,145
21. 6 2/15
22. 48
23. 2 1/3
24. 11
25. 2
26. 336 sq. in.
27. 319 mi.
28. 300%
29. 18%
30. 23,750–26,250
31. 52.2
32. 3.15
33. 150
34. 625/16 or 39 1/16
35. 1/2
36. 1200
37. 25
38. 469
39. 450 min.
40. 15200–16800
41. .1
42. .6
43. 6
44. —3
45. 0
46. —1
47. 8
48. 13
49. 6
50. 6298.5–6961.5
51. 40 eggs
52. 8 in.
53. 36 in.
54. 6
55. 3/2
56. 4 gal.
57. 6
58. 2.89
59. 35%
60. 171–189
61. 0
62. 45%
63. 31.5
64. 48 sq. ft.
65. 336 sq. in.
66. 51 3/7°
67. 2
68. 24,025
69. 12
70. 3,427,125–3,787,875
71. 8
72. 120
73. 189
74. 55
75. 146 2/3 ft. per sec.
76. 25
77. 1624
78. 10
79. 6
80. 12,844–14,196

Answer Key
Number Sense Test EE-4

1. 114
2. 224
3. 188
4. 783
5. 7 1/4
6. 160
7. 1521
8. 9025
9. 4891
10. 9,500–10,500
11. 3000 kilo.
12. $95.00
13. 3978
14. 4/3
15. 9/10
16. 54
17. 3 9/10
18. 450 gal.
19. 217
20. 36,166.5–39,973.5
21. 1/3
22. 8
23. 11/15
24. 10,000
25. 37
26. 32
27. 32
28. 672
29. 64
30. 17,698.5–19,561.5
31. —1/2
32. 529
33. —4
34. 9
35. —1/4
36. 7.62
37. 1.8
38. 6400
39. 180
40. 99,750–110,250
41. 24
42. 120
43. 12.3
44. .9
45. $4.00
46. 6.6 gal.
47. 150 pesos
48. 687.5 mi.
49. 12 1/2%
50. 242,000–
378,000 cu. ft.
51. .216
52. 110
53. 132 ft. per sec.
54. 2 1/2 sec.
55. 70
56. $\sqrt{18}$
57. 10
58. 120 $\sqrt{2}$ sq. in.
59. 8
60. 965.65–1078.35
61. 11 1/9%
62. 16 2/3%
63. 91 days
64. 16
65. 32
66. 9
67. 23
68. 900
69. 1
70. 4,796,360–5,801,240
71. 9
72. 5
73. 7
74. 78
75. 6
76. 13 in.
77. 3/2
78. 24 in.
79. 6318
80. 13,205–14,595

Answer Key
Number Sense Test EE-5

1. 99
2. 103
3. 44
4. 288
5. 12
6. 135
7. 324
8. 7225
9. 6396
10. 7581–8379
11. 6 1/6
12. 1 3/10
13. 240
14. 1/3
15. 90 days
16. 64
17. 5
18. 8
19. 168
20. 18,715–20,685
21. 1
22. 42
23. 5
24. 225
25. 3 2/35
26. 1/9
27. 10
28. $.72
29. 2/3
30. 779–861
31. 6 yr.
32. 40 gal.
33. 75
34. 30
35. 1/5
36. 9.22
37. 490
38. 55
39. 16
40. 218,120–241,080
41. —75
42. 45°
43. 50
44. 144
45. 2.3
46. 58 yr.
47. 51 3/7 min.
48. 31 1/4 bales
49. $5.00 dollars
50. 7505–8295
51. 100 m. p. h.
52. 6084
53. 8.41
54. 6%
55. 26
56. 3 1/2
57. 6
58. 135°
59. 6
60. 2375–2625
61. 4/9
62. 4 1/2
63. $38.40
64. 47
65. 21
66. 20%
67. 1281
68. 94
69. 225
70. 152–168
71. 4
72. 10 days
73. 1261
74. 60%
75. 69%
76. 0
77. 102
78. 66 2/3 m.p.h.
79. 7
80. 2128–2352

Answer Key
Number Sense Test EE-6

1. 1346
2. 32
3. 192
4. 4
5. 7 5/6
6. 3 23/24
7. 312
8. 2/7
9. 15625
10. 562,590–621,810
11. 100,111
12. 8
13. 16
14. 1571
15. 3
16. 5
17. 37/99
18. 46
19. 252
20. 2280–2520
21. 4
22. $6.80
23. 6
24. 32° 40′
25. 5
26. 1
27. 1260
28. 180
29. 9/7
30. 11590–12810
31. 15/7
32. 6
33. 64 oz.
34. 3/8
35. 2/13 + 3/13 i
36. .175
37. 6
38. $5\sqrt{2}$
39. 1
40. 902.5–997.5
41. 2/3
42. 784
43. (—2,2)
44. 6
45. 144
46. 54
47. 27
48. 6241
49. 1440 min.
50. 14345–15855
51. 2 2/5
52. 444
53. 6
54. 150°
55. $-2\sqrt{2}$
56. (5 1/2,5)
57. 17/19
58. 312
59. 12
60. 41,420–45,780
61. 72
62. 0.9292
63. 7569
64. 8064
65. 1850
66. 9
67. 105
68. 4
69. 28
70. 13,034–14,406
71. 67/77
72. 1260°
73. 360°
74. 11
75. 1/4
76. 1
77. 1
78. 9 gal.
79. $1782
80. 25,175–27,825