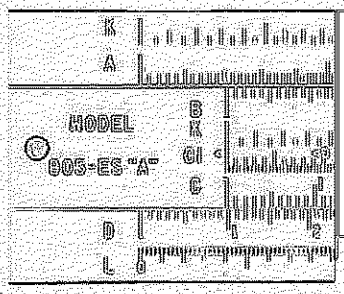

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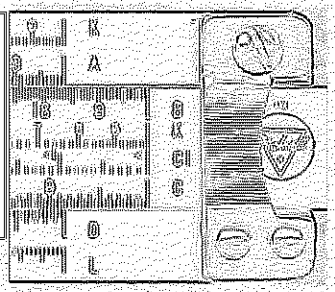
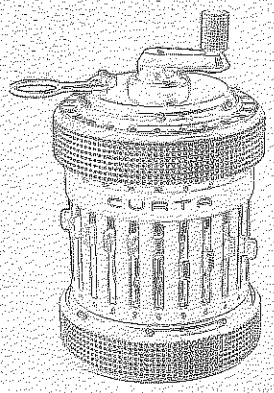
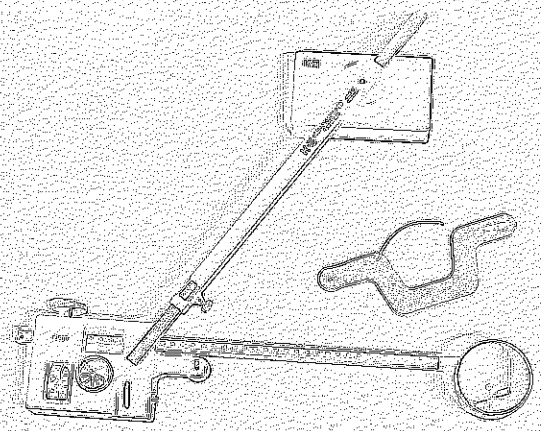
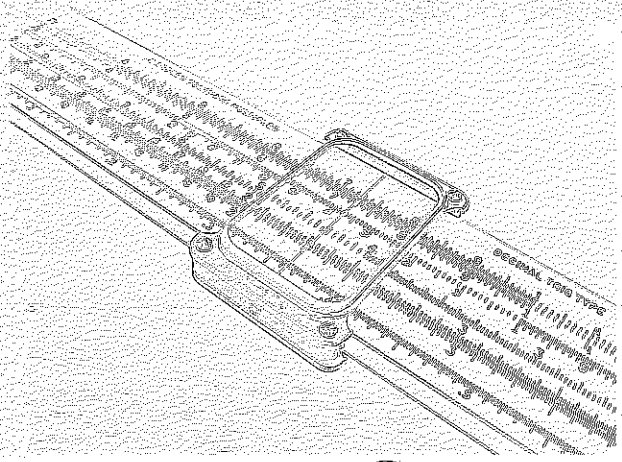
E-Mail - webmaster@texasmath.org

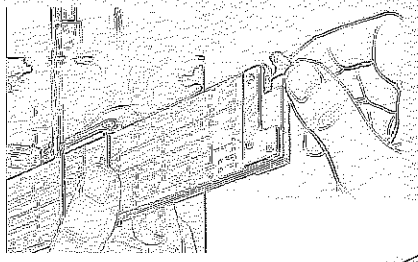


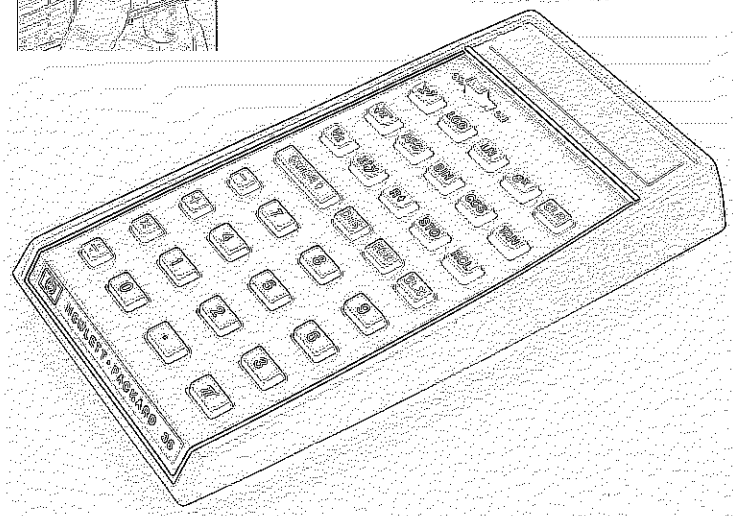
1966-67 UIL Number Sense
(18 pages)

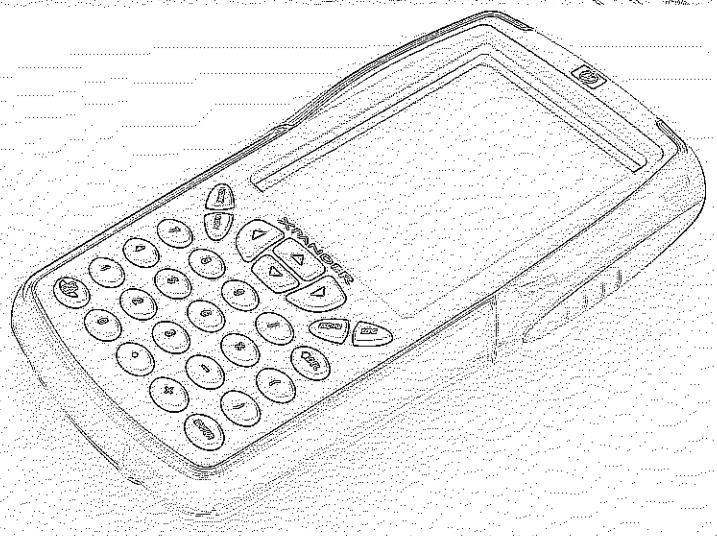


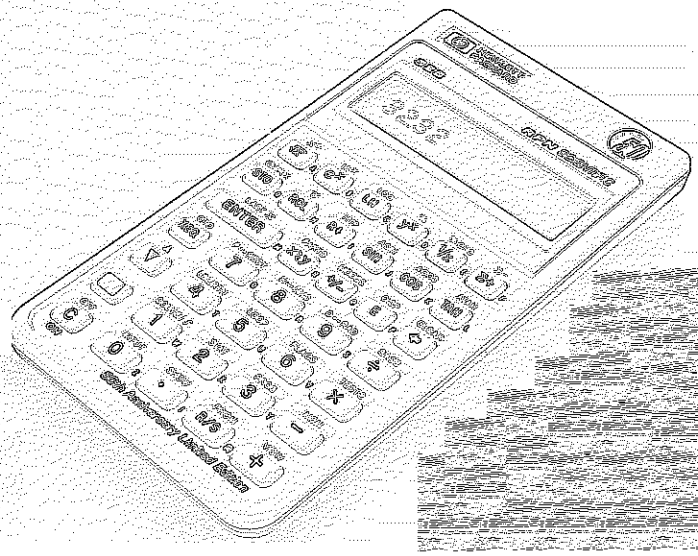


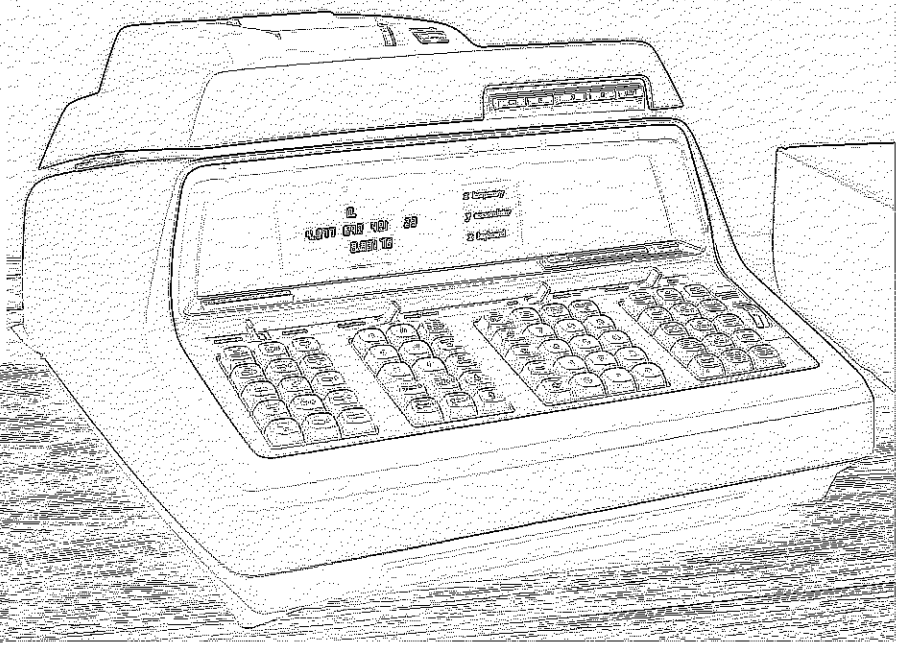












The University of Texas Interscholastic League

Number Sense Test, Series Z-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) $22 + 38 - 29 =$ .....

(2) $74 + 88 =$ .....

(3) $81 - 59 + 18 =$ .....

(4) $13 \times 14 =$ .....

(5) $87 \div 29 =$ .....

(6) Find the area of a square with perimeter 88′. ..... sq. ft.

(7) $132 \div 31 =$ .....

(8) $35 \div 2\frac{1}{2} =$ .....

(9) 27 sq. yd. = ... sq. ft.

*(10) Estimate the cost of 92 lb. meat at 85¢ per lb. $.....

(11) $10 \times 7\ 7/12 =$ .....

(12) $\frac{1}{2} \times 45\frac{1}{2} =$ .....

(13) $45\frac{3}{4} - 29\frac{1}{2} =$ .....

(14) $35\frac{1}{4} - 19\frac{3}{8} + 8\frac{5}{8} =$ .....

(15) $3\frac{1}{4}\%$ of \$400 = $.....

(16) Write in figures $1\frac{7}{8}$ million. .....

(17) $28\frac{1}{2}\% =$ ..... (fraction).

(18) $10.8 + 16.5 + 33.4 =$ .....

(19) $15 \times 25 \times 16 =$ .....

*(20) $37 \times 44.82 =$ .....

(21) Tom got 25 hits out of 175 trips to bat. What was his batting average? .....%.

(22) At \$1.20 per hr., how long will it take to earn \$180? .....hr.

(23) What will 39 peaches cost at 60¢ per doz.? $.....

(24) How many yards are in 109 in.? .....yd.

(25) Which is smaller: pi or 3.1416? .....

(26) At 3/16 lb. each how many pounds of sugar are needed for 56 people? .....lb.

(27) $18\frac{3}{4}\% =$ .....(fraction).

(28) $135 \times 135 =$ .....

(29) At 4 cu. yd. per load, how many loads of dirt will move the dirt for an 9′ × 24′ × 30′ cellar? .....loads.

*(30) How many gallons of water at $7\frac{1}{2}$ to the cubic ft. are in a 30′ × 25′ × 20′ tank? .....gal.

(31) At 12¢ per \$100, what is the cost of insuring a home for \$12000? $.....

(32) At what price must a car costing \$1800 be sold to make a profit of 22 2/9%? $.....

(33) 9 1/11% of 671 bu. = ...bu.

(34) What is the next prime greater than 138? .....

(35) Assuming $\sqrt{3} = 1.7$, find the area of an equilateral triangle of side 4′. .....sq. ft.

(36) Using the same value of $\sqrt{3}$, what is the area of a regular hexagon of side 4″? ..... sq. in.

(37) How many positive integers less than 9 are relatively prime to 9? .....

(38) How many positive integers less than 8 are relatively prime to 8? .....

(39) How many positive integers less than 8×9 are relatively prime to 8×9? .....

*(40) A house valued at \$13200 was insured at $\frac{2}{3}$ is value at a premium of 29¢ per \$100 valuation. Find the total premium. $.....

(41) If a man pays \$6.25 a week for board, how much will he pay in 52 weeks? $.....

(42) What is the sum of the primes between 10 and 20? .....

(43) What is the greatest common divisor of 30, 42, and 66? .....

(44) What is the least common multiple of 18 and 30? .....

(45) Find the sum of the integers between 10 and 20, including 10 and 20 . .....

(46) At 12½ pesos to the dollar, \$25 = ...pesos.

(47) If A is 30% less than B which is 30% less than C, then A is what percent less than C? .....%.

(48) If a one inch cube weighs one ounce, at the same rate, how much does a cube with edge of 3 inches weigh? .....oz.

(49) Find the smallest prime p such that 2p + 7 is a prime. p = ...

*(50) Find the altitude of a rectangle of area 1256 sq. ft. and base 92 ft. ..... ft.

(51) ({0, 1, 2} ∪ {1, 2, 3}) ∩ {1, 3, 4} = {.....}.

(52) {0, 1, 2} ∩ ({1, 2, 3} ∪ {1, 3, 4}) = {.....}.

(53) How many sets are in the power set for {1}? .....

(54) How many ordered pairs are in the Cartesian product of {a, b} and {a, b, c, d}? .....

(55) {0, 1, 2} ∪ ({0, 3} ∩ {0, 4}) = {.....}.

(56) ({0, 1, 2} ∪ {0, 3}) ∩ ({0, 1, 2} ∪ {0, 4}) = {.....}.

(57) 31¼% = ... (fraction).

(58) 19 2/9% = ... (fraction).

(59) If 66⅔% = 84, then 100% = ...

*(60) 68% of 45 = ...

(61) At 7½ gal. per cu. ft., how many gallons will a rectangular trough 5′ × 3′ × 1′ hold? ..... gal.

(62) If a right section of a trough 10′ long is an inverted isosceles triangle of base 2′ and altitude 1′, what is its capacity at 7½ gal. per 1 cu. ft.? ..... gal.

(63) 9/16 = ...%.

(64) Find the area of a trapezoid whose bases are 18′ and 24′ and whose altitude is 21′. .....sq. ft.

(65) A team won 16/19 of its 114 games. How many did it lose?.....

(66) If a secant from A intersects a circle at B and C so that AB = 9′ and AC = 16′, then a tangent from A to the circle has length .....ft.

(67) Find the cost of 57 cans of milk at 3 for 47¢. \$.....

(68) Find the amount due on a note for \$750 at 8% for 2 yr. \$.....

(69) Tom's salary is \$30 per wk. Last week he made 6% commission on \$900. His total income for the week was \$.....

*(70) 87 × 73 = ...

(71) Men A and B may date only ladies C and D tonight. What is the probability that, if both men have dates tonight, A will date C and B will date D? .....(fraction).

(72) A rectangular field is 300′ by 100′ and the fence posts are 10 ft. apart. How many are there? .....

(73) At 3½ miles per hr., how long will it take to walk 17 mi.?.....hr.

(74) Mr. Johnson paid for his \$10000 home in 4 years in 4 equal yearly payments of \$2500 plus 6% interest on the unpaid balance. What was his total payment for the home? \$.....

(75) If Tom is twice as old as Charles and the sum of their ages is 12, how old is Tom? .....yr.

(76) If Tom is 9 years older than Mary and next year will be twice as old as she, how old is Mary now? .....yr.

(77) After a 37½% raise, John made \$1122. How much did he make before his raise? \$.....

(78) How many minutes are there from 3:45 A.M. to 6:15 P.M. the same day? .....min.

(79) If a grocer pays 18¢ per lb. for chickens which he sells for 24¢ per lb., how much profit will he make on 125 chickens which average 2½ lb. each? \$.....

*(80) 21,322 ÷ 57 = ...

The University of Texas Interscholastic League

Number Sense Test, Series Z-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 the 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) $128 + 37 - 29 =$ .....

(2) $87 \times 90 =$ .....

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

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

(5) $31\frac{2}{3}\% =$ ..... (fraction).

(6) $7/16 =$ .....%.

(7) $1.9 \times 1.7 =$ .....

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

(9) $23 + 38 - 17 =$ .....

*(10) $2896 + 3214 + 817 + 5123 =$ .....

(11) ½ is to ⅔ as 4½ is to .....

(12) $187 \div 1.1 =$ .....

(13) What percent of 150 is 175? .....%.

(14) $25 \times 392 =$ .....

(15) $115 \times 115 =$ .....

(16) $87 \times 93 =$ .....

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

(18) $.7 \times 6.82 =$ .....

(19) $2057 \div 17 =$ .....

*(20) $1672 \times 846 =$ .....

(21) Write down the larger of 15/17 and 77/87. .....

(22) What is the smallest postive integer x such that $42x = 66y$, with y a positive integer? .....

(23) $87^2 = 80^2 + (2 \times 7 \times 80) +$ .....

(24) $78^2 - 76^2 = 2 \times$ .....

(25) 23 gal. and 2 qt. = ...pt.

(26) At 12½ pesos to the dollar, 2125 pesos = $.....

(27) Which is smaller, $\sqrt{3}$ or 1.73? .....

(28) How many cubic yards will a rectangular bin $9' \times 15' \times 6'$ hold? .....cu. yd.

(29) 30% of 70% = ...%.

*(30) $64772 \div 171 =$ .....

(31) Write down the smaller of the next two primes greater than 95 whose difference is 2. .....

(32) What is the cost of insuring a $20000 house at 25¢ per hundred, on .6 of its value? $.....

(33) The sum of the integers from 1 to 100 inclusive is .....

(34) The product of the divisors of 6 is .....

(35) The sum of the positive integers less than 15 which are prime to 15 is .....

(36) The number of primes between 120 and 135 is .....

(37) The sum of the greatest common divisor and least common multiple of 15 and 21 is .....

(38) The exact number of days from Sept. 20, 1956 until Feb. 16, 1957 was ..... days.

(39) The next leap year after 1967 is .....

*(40) $\sqrt{1796}$ .....

(41) 3½ miles ..... yd.

(42) At $1.50 per hr., how long will it take to make $604.50? ..... hr.

(43) How many ounces are in an 8 oz. true conical glass filled to one-half its depth? .....oz.

(44) The hypotenuse of a 30°–60° right triangle with long leg of $5\sqrt{3}$ in. is ..... in.

(45) Find the cost of 1 lb. smoked herring at the rate of 10¢ for 2 oz. .....¢.

(46) Find the total cost of eight "reject" tires at $15 each plus 2% state tax. $.....

(47) The number of divisors of 144 is .....

(48) The smaller root of $\sqrt{25 - x^2} = 3$ is .....

(49) If $4^x = 1/16$, then $x =$ .....

*(50) Find John's batting average if he got 17 hits in 59 trips to the plate. .....%.

(51) How many distinct solutions does $x^3 - 3x^2 + 3x - 1 = 0$ have? .....

(52) The Cartesian Product of {2, 1} by its power set has .....elements.

(53) If $A \supseteq B$, then $A \cup B =$ .....

(54) If $A \supseteq B \supseteq C$, then $(A \cup B) \cup (B \cup C) =$ .....

(55) If $A \supseteq B \supseteq C$, then $(A \cap B) \cup (A \cap C) =$ .....

(56) If A contains three elements and $A \times C$ contains forty-five elements, then C contains .....elements.

(57) How many subsets with exactly two elements are in a set with 4 elements? .....

(58) The coefficient of a^3b^2 in $(a + b)^5$ is .....

(59) If the power set for A contains 64 elements, then A contains ..... elements.

*(60) $328 \times 63 =$ .....

(61) The sum of all the coefficients of the four terms of $(a + b)^3$ is .....

(62) Counting those deceased, everyone has ..... great grandpas.

(63) $1000 at 5% compounded annually, in two years amounts to $.....

(64) What is the largest divisor of 180 which is less than 60?.....

(65) At 17 miles per gallon, on 30 gal., a car will go .....mi.

(66) In a 5′, 12′, 13′ right triangle, the length of the projection of the short leg on the hypotenuse is .....ft.

(67) If I pick 250 lb. cotton per 10 hr., how many hours will it take me to pick 1500 lb.? .....hrs.

(68) 15 men did a job in 11 days. At the same rate, how many days would it take 11 men? .....days.

(69) If 3 1/7 is used for π, what part of a square is in the inscribed circle, ...

*(70) 1/6 of women have never married; 2/7 of all women who ever married fail to have husbands now. At this rate, how many women out of 1000 do not have husbands? .....

(71) Find the product of the two primes between 40 and 45. .....

(72) If three hens lay three eggs in three days, how long, at the same rate, will it take 10 hens to lay 30 eggs? .....days.

(73) At 7½ gal. to the cu. ft., how many gallons are in a bin 3 yd. by 1 yd. by 2 ft.? .....gal.

(74) The area of a trapezoid with bases 30′ and 20′ altitude 35′ is .....sq. ft.

(75) $79 \times 87 =$ .....

(76) At 7% commission and a salary of $25 per week, what is my total weekly salary if my sales amount to $2000 per wk.? $.....

(77) If John is twice as old as he was ten years ago, his present age is .....yr.

(78) What was Mr. Jones' percent raise if he was raised from $770 to $880 per mo.? .....%.

(79) $(75 \times 75) - (75 \times 65) =$ .....

*(80) How many seconds are in a 24 hr. day? .....sec.

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

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

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Stop—Wait for Signal

(1) $92¢ + 37¢ + 88¢ =$ $.....

(2) $142 + 78 - 46 =$ .....

(3) (19 yd. 1 ft.) — (8 yd. 2 ft.) = ...yd. .....ft.

(4) $16.23 + 7.81 =$ .....

(5) Find the perimeter of an equilateral triangle whose area is $484\sqrt{3}$ sq. ft. .....ft.

(6) $9100 \div 70 =$ .....

(7) A trapezoid has area of 440 sq. ft. and bases of 20′ and 24′. The altitude is .....ft.

(8) $420 \div 7\frac{1}{2} =$ .....

(9) $39 \times 39 =$ .....

*(10) If 1 mile = 1609 meters, 27,353 meters .....mi.

(11) $(81 \times 72) \div (27 \times 24) =$ .....

(12) $29 \times 31 =$ .....

(13) $13\frac{1}{3} \times 40 =$ .....

(14) $826 - 629 + 32 =$ .....

(15) $62\frac{1}{2}\%$ of $616 =$ .....

(16) $\frac{3}{4} \times 516 \times \frac{2}{3} =$ .....

(17) $1\frac{7}{8} \times 816 =$ .....

(18) $16\frac{2}{3} \times 75 =$ .....

(19) $63 \div 2\frac{1}{4} =$ .....

*(20) $6.3 \times 7.15 \times .25 =$ .....

(21) Find the diameter of a circle with area of 16 pi sq. ft. .....ft.

(22) $3.58 is what percent of $44.75? .....%.

(23) $19\frac{2}{3}\% =$ .....(fraction).

(24) $5/7 =$ .....%.

(25) Find the largest integer less than 385 which is relatively prime to 385. .....

(26) $61\frac{1}{4} \times 5\frac{1}{2} =$ .....

(27) If A is 20% more than B which is 15% more than C, then A is what percent more than C? .....%.

(28) $69 \times 71 =$ .....

(29) $61\frac{1}{2} \times 5\frac{1}{4} =$ .....

*(30) Estimate the circumference of a circle with an area of 1200 sq. ft. .....ft.

(31) $37\frac{1}{2} \times 96 =$ .....

(32) Which is greater 27/31 or 28/32? .....

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

(34) What is my income tax on a taxable income of $8000 at 16% on the first $4000, 18% on the next $3000 and 20% of any portion of the next $2000? .....

(35) What is the area of an isosceles right triangle with hypotenuse of 40′? .....sq. ft.

(36) What is the smallest prime greater than 7×13? .....

(37) Find the sum of the integers between 8 and 20 inclusive. .....

(38) Find the product of the integers between 1 and 6 inclusive. .....

(39) Find the sum of the divisors of $3 \times 4 \times 5$. .....

*(40) If a man paid $7\frac{1}{2}\%$ interest on $636 for 2 yr., the total amount, including the principal, repaid was $.....

(41) How many divisors does $3^2 \times 2^3 \times 5^2$ have? .....

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

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

(44) Chords A and B of a circle intersect so that the segments of A are 12′ and 15′ and one segment of B is 18′. What is the length of the other segment of B? .....ft.

(45) What is the closest the centers of two tangent circles of area 25 pi and 36 pi sq. in. can be .....in.

(46) If 25 plus the square of Tom's age in years less 10 times his age in years is zero, then Tom's age is .....yr.

(47) If $1/x^2 = 9$ and $x < 0$ then $x =$ .....

(48) At 12½ pesos to the dollar, what is the worth of 625 pesos? $.....

(49) If the dimensions of a tank are each multiplied by 3/2, the volume is multiplied by .....

*(50) 27% of 49% of 7234 is .....

(51) If ϕ is the null set and A is a set, $A \cap \phi =$ .....

(52) If $A \supseteq B$ and $A \supseteq C$, then $(A \cup B) \cup (A \cup C) =$ .....

(53) $(\{0, 1, 2\} \cup \{1, 2, 3\}) \cap \{2, 3, 4\} = \{$.....$\}$.

(54) If P is the power set for {1, 2} and Q is the power set for {1, 2, 3} then $P \times Q$ contains .....elements.

(55) $(\{0, 1, 2\} \cup \{1, 2, 3\}) \cap \{2, 3, 4\} = \{$.....$\}$.

(56) $(\{0, 1, 2\} \cap \{2, 3, 4\}) \cup (\{0, 1, 2\} \cap \{2, 3, 4\}) = \{$.....$\}$.

(57) If the sides of a right triangle are 3′, 4′, and 5′ then the length of the projection of the long leg on the hypotenuse is .....in.

(58) If a diagonal of a square divides the square and colors red, white and blue may be used, how many ways may the whole square be painted so that two colors are used each time? .....

(59) In the above problem, if we allow the whole square to be painted the same color, how many ways may we paint it? .....

*(60) 129% of 6237 = ...

(61) $2\frac{2}{3} + 3\frac{1}{6} + 4\frac{3}{4} =$ .....

(62) 5/9 = ...%.

(63) 6270 eggs = ...doz.

(64) A telephone line having a post at each end, with posts 100 yd. apart, spans a 30 mile distance. How many posts does it have? .....

(65) Find the smaller of x and y such that $x + y = 1$ and $x - y = 3$. .....

(66) What is the total check if I paid $4000 for the car, $20 for license, 2% sales tax, $140 insurance, and $2 for inspection? $.....

(67) On their trip, the Jones ate 22 meals at 70¢ each, drove 3000 mi. at 2¢ per mile, slept 10 nights in motels at $8 per night, and had $28 incidental expense. The total expense was $.....

(68) $3\frac{1}{3} \times 3\frac{3}{8} =$ .....

(69) Jones made $10000 per year and got a 6¼% raise. Now he makes $.....

*(70) $328 \times 63 =$ .....

(71) 10 men did a job in 72 days. At this rate how long would it take 12 men? .....days.

(72) What is the smallest positive integer x such that for y a positive integer, $12x = 21y$? .....

(73) What is the largest prime such that the sum of its digits is 2? .....

(74) What is the smallest prime such that the sum of its digits is 2? .....

(75) The smallest positive two digit integer such that the sum of its digits is 7 and the product is 10 is .....

(76) The only other positive integer described in problem 75 is .....

(77) 50 years ago the average yearly salary for the next 50 years for people with B.A. degrees was $6000 while that for those without degrees was $2000. At this rate, how much did one increase his earnings in 50 years by getting a B.A. degree? $.....

(78) Suppose the above figures are doubled for the next 50 years. At this rate, what is the total 50 year expected increase in a new B.A. graduate's earnings? $.....

(79) $26\frac{2}{3} \times 37\frac{1}{2} =$ .....

*(80) $1416 + 833 + 1814 + 945 - 1252 =$ .....

The University of Texas Interscholastic League

Number Sense Test, Series Z-4

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 the 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) $12 - 127 + 1322 =$ .....

(2) $1321 - 777 =$ .....

(3) $9\frac{3}{8} \times 72 =$ .....

(4) $(32 \times 56) - (8 \times 28) =$ .....

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

(6) $924 \div 21 =$ .....

(7) 44 4/9% of 1143 = ...

(8) $75 \times 176 =$ .....

(9) $3236 \div 13 =$ .....

*(10) Find the volume of a right circular cylinder with altitude 105 ft. and diameter of base, 11 ft. .....cu. ft.

(11) $7/8 \times 56\ 8/9 =$ .....

(12) $86\frac{1}{3} \div 4 =$ .....

(13) $92 \times 88 =$ .....

(14) $6\frac{1}{2}\%$ of 98 = ...

(15) 5/13 = ...%.

(16) 91 = $87\frac{1}{2}\%$ of .....

(17) $31\frac{3}{4}\%$ = ...(fraction).

(18) 162/80 = ...%.

(19) Find the interest on $213 for 2 yr. at 6%. $.....

*(20) $9 \times 10 \times 11 \times 13 \times 14 =$ .....

(21) Find the area of a triangle whose sides are 6", 5", and 5". .....sq. in.

(22) Find the area of a triangle with sides 7', 24', and 25'. ..... sq. ft.

(23) How many degrees are in a central angle of a regular nine-sided polygon? .....°.

(24) If a child weighing 20 lb. is 2 ft. high, is similar in shape to, and has the same weight per cu. in. as a 6 ft. man, then the man weighs .....lb.

(25) Find the next term: 2, 6, 12, 20, 30, ...

(26) If $3x - 4 = 2x + 7$, then x = ...

(27) $7^3 =$ .....

(28) $29^2 =$ .....

(29) $145 \times 145 =$ .....

*(30) $621 \times 622 =$ .....

(31) How many unequal sums of two different integers can be formed from 1, 2, 3? .....

(32) Find the largest prime divisor of 396. .....

(33) The smaller solution on $x^4 - 8x^2 + 16 = 0$ is x = ...

(34) How many positive integers less than or equal 42 are relatively prime to 42? .....

(35) How many positive integral divisors does 42 have?.....

(36) The sum of the positive integral divisors of 42 = ...

(37) How many primes are between 20 and 40? .....

(38) $3\frac{1}{4} + 5\frac{1}{6} =$ .....

(39) Find the average of 6, 8, 10, 12, 14: .....

*(40) 47% of 16,293 = ...

(41) $(135 \times 28) \div (42 \times 81) =$ .....

(42) $\frac{1}{6}$ of $25\frac{3}{4} =$ .....

(43) $525 is what percent of $15,000? .....%.

(44) Write in figures, one hundred one million, twenty-five thousand five. .....

(45) Find the cost of 30 gal. gas at 29.9¢ per gal. $.....

(46) Change $35 to pesos at $12\frac{1}{2}$ to the dollar. .....pesos.

(47) 125 is what percent of 75? .....%.

(48) Find the least common multiple of 81, 45, 63. .....

(49) Rectangle I is similar to rectangle II. The sides of I are 6' and 9'. The area of II is 27 sq. ft. The short side of II is .....ft.

*(50) At 231 cu. in. to the gal., how many gallons are in a right circular cylindrical tank of diameter 24″ and height 36″? .....gal.

(51) $24 = 6/11$ of .....

(52) At 90 m.p.h. how many ft. per second am I traveling? ..... ft. per sec.

(53) $(\{0, 1, 2\} \cup \{1, 2, 3\}) \cap (\{0, 1, 2\} \cup \{2, 3, 4\}) = \{$.....$\}$.

(54) $\{0, 1, 2\} \cap (\{1, 2, 3\} \cup \{2, 3, 4\}) = \{$.....$\}$.

(55) $(\{0, 2, 3\} \cap \{1, 2, 3\}) \cup (\{0, 1, 2\} \cap \{2, 3, 4\}) = \{$.....$\}$.

(56) How many elements are in the power set for $\{a, b\} \times \{a, b, c\}$? .....

(57) How many elements are in the Cartesian product of the power set for $\{a, b\}$ and the power set for $\{a, b, c\}$? .....

(58) $15.65 - 82.41 =$ .....

(59) $5\frac{2}{3}\% =$ .....(fraction).

*(60) A solid is bounded by four equilateral triangular faces, each with edge 12″. Its volume is .....cu. in.

(61) $36 \times 12\frac{3}{4} =$ .....

(62) If the area of a square decreases from $20\frac{1}{4}$ sq. in. to $6\frac{1}{4}$ sq. in., find the decrease in the perimeter. .....in.

(63) At 62 miles per hour, how far will a car travel in $4\frac{1}{2}$ hours? .....mi.

(64) The greatest common divisor of 13225 and 10 is .....

(65) The interest on \$700 for 90 days at 7% a year is \$.....

(66) $3\frac{1}{3}\%$ of $37\frac{1}{2}\%$ of \$960 = \$.....

(67) Divide seven million five hundred thousand by two hundred fifty thousand. .....

(68) $15\frac{5}{8} + 7\frac{1}{2} - 9\frac{3}{8} =$ .....

(69) $6.25 \times 1.80 =$ .....

*(70) 93% of 2.171 = ...

(71) Write in ordinary Arabic figures, the equivalent of Roman numeral MDCXXIV. .....

(72) $\{0, 1, 2\} \cup (\{1, 2, 3\} \cap \{2, 3, 4\}) = \{$.....$\}$.

(73) How many ten thousands are in thirty six million? .....

(74) If 34 bushels of peaches cost \$117, how much should 51 bushels cost? \$.....

(75) At 70 miles per hour and a loss of 30 minutes, what is the total time it will take to travel 805 miles? .....hr.

(76) $37\frac{1}{2}$ is to $62\frac{1}{2}$ as what is to 40? .....

(77) $102 \times 71 =$ .....

(78) The next term of 4, 6, 10, 16, 26, 42, . . . is .....

(79) $\sqrt[3]{1331} =$ .....

*(80) $39^3 =$ .....

The University of Texas Interscholastic League

Number Sense Test, Series Z-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 the 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) $192 + 326 =$ .....

(2) $126 - 231 + 378 =$ .....

(3) $21 \times 29 =$ .....

(4) $85 \times 85 =$ .....

(5) $92 \times 88 =$ .....

(6) $83\frac{1}{3}\%$ of $966 =$ .....

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

(8) $7/16 =$ .....%.

(9) $16\frac{1}{2}\% =$ .....(fraction).

*(10) $213 + 3213 + 2372 + 5613 =$ .....

(11) What percent of 66 is 77? .....%.

(12) $2/3 \times 6/7 \times 21/32 =$ .....

(13) $2\frac{1}{2} \times 3\frac{1}{6} =$ .....

(14) $7\frac{1}{2} \div 1\frac{1}{4} =$ .....

(15) $6.7 \times 2.5 =$ .....

(16) 22 2/9% of what number is 198? .....

(17) $1/21 + 1/35 =$ .....

(18) What is the smallest number of 88 lb. bags that will exactly balance an integral number of 77 lb. bags? .....

(19) 5 miles = ...ft.

*(20) $2132 \times 172 =$ .....

(21) 75 miles per hour = ...ft. per sec.

(22) At .621 miles per kilometer, how many kilometers are in 621 miles? ..... kilometers.

(23) At $12\frac{1}{2}$ pesos to the dollar, what is the dollar equivalent of $31\frac{1}{4}$ pesos? $.....

(24) $31 \times 57 =$ .....

(25) What is the sales tax on $10,000 at $2\frac{1}{2}\%$? $.....

(26) John's taxable income is $10,000. The rate is 14% on the first $4000, 18% on the next $4000, and 22% on the next $4000 or fraction thereof. What is his tax? $.....

(27) If chickens cost 15¢ per lb. and the overhead is 10%, how much will a man make on 100 lb. if he sells at 25¢ per lb.? $.....

(28) How long will it take to make $100 at $1.25 per hr.? .....hr.

(29) Tom's salary is $1200 per mo. If the monthly takeouts are: $16\frac{2}{3}\%$ income tax, 3% social security, and $14 for insurance, what is his actual monthly check? $.....

*(30) What is the interest on $1012 for $2\frac{1}{2}$ yr. at $5\frac{3}{4}\%$? $.....

(31) Which is larger 2/3 or 21/31? .....

(32) A batter gets 17 hits out of 102 times at bat. What is his batting average? .....%.

(33) In the football game, Tom made 6, 12, 3, 3, and 4 yds. and lost 2 and 5 yds. His average yardage was .....yd.

(34) At $7\frac{1}{2}$ gal. to the cu. ft., how many gallons are in a 2 ft. by 6 yd. by 9 ft. bin? .....gal.

(35) What is the area of a square of side $6\sqrt{3}$ ft.? .....sq. ft.

(36) My $20,000 house is taxed at $\frac{2}{3}$ value at 2¢ on the dollar. What is my yearly tax? $.....

(37) $(21 \times 64) \div (14 \times 32) =$ .....

(38) What is the largest prime divisor of 114? .....

(39) How many divisors does 100 have? .....

*(40) Estimate $21 \times 22 \times 23 \times 24$. .....

(41) What is the sum of the divisors of 100? .....

(42) How many integers less than or equal to 100 are relatively prime to 100? .....

(43) What is the product of the greatest common divisor and least common multiple of 21 and 77? .....

(44) How many primes are between 150 and 160? .....

(45) How many elements are there in the power set for the set of primes less than 8? .....

(46) How many elements are in the Cartesian product of the set of positive integers less than or equal 5 and relatively prime to 5 by itself? .....

(47) The smaller solution of $\sqrt{25 - x^2} = 3$ is .....

(48) How many solutions does $x^2 - 5x + 6 = 0$ have? .....

(49) What is the sum of the solutions of $x^2 - 5x + 6 = 0$? .....

*(50) $27621 \div 372 =$ .....

(51) $\{a, b\} \cup (\{c, a, b\} \cap \{a, b\}) = \{$.....$\}$.

(52) $\{a, b\} \cap (\{c, a, b\} \cup \{a, b\}) = \{$.....$\}$.

(53) $(\{a, b\} \cup \{c, a, b\}) \cup \{a, b\} = \{$.....$\}$.

(54) If ϕ is the null set, $\{a, b, c\} \cup (\{a, b\} \cap \phi) = \{$.....$\}$.

(55) If $(2/3)^x = 9/4$, then $x =$ .....

(56) What is the smallest perfect square (integer) greater than the 4th odd prime? .....

(57) If $2x + 3 \geq x - 7$, the smallest value x can have is .....

(58) The next number of the sequence 0, 7, 26, 63 . . . is .....

(59) $13^3 =$ .....

*(60) $47^3 =$ .....

(61) $51^3 =$ .....

(62) The coefficient of the third term of $(a + 3b)^3$ is .....

(63) If $17/9 = 51/x$, then $x =$ .....

(64) What is the interest on a $10000 certificate of deposit for 6 mo. at 5¼%? $.....

(65) If A is 50% less than B which is 50% less than C, then A is what percent less than C? .....%.

(66) If $x + y = 7$ and $x - y = 1$, then $y =$ .....

(67) If the sum of the perimeters of two squares is 40″ while the difference is 10″, the area of the smaller is .....sq. in.

(68) $22\frac{1}{2} \times 3\frac{1}{8} =$ .....

(69) The tangent from P to a circle is 15 in. long. If a secant from P intersects the circle at A and B so that PA = 5 in., then PB = ...in.

*(70) $3.4 \times 7.1 \times 8.8 =$ .....

(71) The diagonals of a rhombus are 7″ and 10″. The area is .....sq. in.

(72) Each interior angle of a regular octagon contains .....°.

(73) If I am twice as old as I was 25 years ago, my present age is .....yr.

(74) If two diagonals are drawn from one vertex of a regular pentagon, thus dividing it into three parts, how many ways may I paint it using both colors, red and blue? .....

(75) 2236 eggs = ...doz.

(76) $2\frac{1}{3} + 3\frac{1}{6} + 4\frac{5}{8} =$ .....

(77) If 18 men do a job in 5 days, how long will it take 15 men? .....days.

(78) What percent raise in a salary of $660 will it take to raise it to $880? .....%.

(79) Find the sum of the integers between 20 and 50 inclusive. .....

*(80) How many revolutions will a wheel with diameter of 30 in. make in rolling a mile? .....

The University of Texas Interscholastic League

Number Sense Test, Series Z-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 the 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) $119 \div 17 =$ .....

(2) $287 - 39 =$ .....

(3) $99 \times 2\ 7/9 =$ .....

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

(5) $150 \times 65 =$ .....

(6) $2/9 \times 18\ 9/11 =$ .....

(7) $17\frac{1}{2} \div \frac{1}{2} =$ .....

(8) 12 sq. mi. = ...acres.

(9) 96 = 5/12 of .....

*(10) $97 \times 8796 =$ .....

(11) $17/6 =$ .....%.

(12) $28\frac{3}{4}\% =$ .....(fraction).

(13) 12 cu. yd. = ... cu. ft.

(14) $3\frac{3}{8} \div 1\frac{1}{2} =$ .....

(15) $720 \times 3\frac{1}{6} =$ .....

(16) $75 \times 75 =$ .....

(17) $85^2 - 75^2 =$ .....

(18) $25 \times 160 =$ .....

(19) $2\ 1/5 \div 5/22 =$ .....

*(20) $162 + 3128 + 196 + 2137 =$ .....

(21) If the moon makes 27 revolution in 28 days, all taking the same time, how much later does it come up each day?
..... minutes.

(22) Find the exact number of days from Feb. 1, 1968 to June 1, 1968.
..... da.

(23) 100 A. of cotton would have made ¼ bales to the acre, but bole weevils cut the yield by 25%. How many acres did it actually take to make a bale? .....A.

(24) What is the smallest number of U. S. coins whose face values total 80¢? .....

(25) Find the principal which invested at 6% yields $300 in four yr.
$.....

(26) A man's change is 7 coins, each either a quarter or a nickel. If the total face value is 95¢, how many quarters has he?
.....

(27) Find the tax on 2204 gal. gas at 8½¢ per gal. $.....

(28) At 12½ pesos to the dollar, what is the dollar value of 52 pesos?
$.....

(29) At 1.61 kilo. to the mile, how fast am I going when traveling 80.5 kilo. per hr.? .....mi. per hr.

*(30) What is the cost of a load of 118 watermelons averaging 35¢ each.
$.....

(31) Find the smallest two digit positive integer such that the sum of its digits is 7 and the product is 12. .....

(32) If $3^x = 1/9$, then x = ...

(33) If $3^{x+y} = 81$ and $3^{x-y} = 1$, then x = ...

(34) Find the side of an equilateral triangle whose area is $25\sqrt{3/4}$ sq. in.
..... in.

(35) How many degrees are in each interior angle of a regular hexagon?
.....°.

(36) The area of a regular hexagon of side $3\sqrt{3}''$ is $\sqrt{3}$ times
..... sq. in.

(37) A line parallel to the base of a triangle bisects one side. The area of the triangle cut off is what part of the total area?.....

(38) If the depth of a 12 oz. glass is 8", then the depth of a 1.5 oz. glass of similar proportions is ..... in.

(39) If $3x + 4 = x - 8$, then x = ...

*(40) $(89 \times 127) + (27 \times 96) =$ .....

(41) If prices go up 16%, what is the advance in price of a $120 piece of furniture? $.....

(42) If a clock loses 30 minutes a day, how long does it take the minute hand to make a revolution? ..... min.

(43) The largest integer less than 188 which is relatively prime to 188 is .....

(44) The number of divisors of $2^2 \times 47$ is .....

(45) The sum of the divisors of $2^2 \times 47$ is .....

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

(47) $375 \times 180 =$ .....

(48) The largest prime less than 188 is .....

(49) The greatest common divisor of 188 and 9 is .....

*(50) $(17923 \times 5832) \div 97 =$ .....

(51) Find the smallest postive integer which each of 30 and 66 divides. .....

(52) In how many orders may the integers 1, 2, 3 be written exactly once in a line? .....

(53) In how many orders may 1, 2, 3 be written exactly once around a circle? .....

(54) Last year my dog ate 365 cans food at 10¢, used 12 boxes heart pills at $1 ea., and had a $40 operation. What was the total expense? $.....

(55) $175 \times 60 =$ .....

(56) $(\{1, 2, 3\} \cup \{1, 2, 3\}) \cap \{0, 1, 2\} = \{$.....$\}$.

(57) $\{1, 2, 3\} \cup (\{1, 2, 3\} \cap \{0, 1, 2\}) = \{$.....$\}$.

(58) $(\{1, 2, 3\} \cap \{1, 2, 3\}) \cup \{0, 1, 2\} = \{$.....$\}$.

(59) $\{1, 2, 3\} \cap (\{1, 2, 3\} \cup \{0, 1, 2\}) = \{$.....$\}$.

*(60) $12796 \div 37 =$ .....

(61) The number of elements in the power set for the set of seven days of the week is .....

(62) The Cartesian product of {1, 2, 7, 9, 6} by {3, 7} contains ..... elements.

(63) I made nectar from 5 lb. sugar at 8¢ per lb. and used a bottle of coloring at 30¢, to feed humming birds. I bought 50 lb. grain at 4¢ lb. for the other birds. What was my expense of feeding all the birds? $.....

(64) The least common denominator of 1/60, 1/90, 1/50 is .....

(65) If the population doubles every 35 yr. and there are 3 billion people now, how long will it take for there to be 24 billion? ..... yr.

(66) At the rate in problem 65, how long has it been since the world population was only 750 million? ..... yr.

(67) If $10 is given for one correct answer, $20 for two, $40 for three, $80 for four, etc., how many correct answers must I give to get $320 .....

(68) 100 acres produced ¾ bales cotton per acre at $120 per bale. What was the worth of all the cotton? $.....

(69) If 5 men did a piece of work in 21 days, how long will it take 42 men to do the same job? ..... days.

*(70) $(287 \div 32) \times 562 =$ .....

(71) If the strength of a piece of timber increases directly with the increase in thickness and directly with the cube of the increase in width, a piece 6″ thick and 8″ wide is how many times stronger than one 2″ thick and 4″ wide? .....

(72) A single increase which is equivalent to two 40% increases is .....%.

(73) 6¼% of $960 is $.....

(74) 1¾ is to 9 as what is to 27? .....

(75) If it costs $5 a mo. to be on the T.V. cable, what will I save in two years by using a $25 aerial and $2 worth of wire instead? $.....

(76) The repair man charged $5 for the call and $2.85 + $4.15 for parts. What could I have saved by doing it myself if I had gotten 40% off on parts? $.....

(77) $2\frac{1}{3} + 7\frac{1}{2} + 9\frac{3}{4} =$ .....

(78) $75\frac{2}{3} \times 75 =$ .....

(79) $(140 \times 60) + (35 \times 60) =$ .....

*(80) $.79 + $.79 + $4.99 + $3.99 + $1.95 + $2.99 + $6.98 + $6.98 = $.....

The University of Texas Interscholastic League

Number Sense Test, Series Z-7

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 the 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) $283 + 227 =$ .....

(2) $62 + 37 - 29 =$ .....

(3) $6\frac{1}{2} - 7\frac{7}{8} =$ .....

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

(5) $7^3 =$ .....

(6) $26^2 =$ .....

(7) $31 \times 29 =$ .....

(8) $175 \times 36 =$ .....

(9) $2\frac{7}{8}\% =$ .....(fraction).

*(10) $8271 \times 329 =$ .....

(11) $5/13 =$ .....%.

(12) $12\frac{1}{2}\%$ of \$1296 = \$.....

(13) $13 \times 691 =$ .....

(14) $85\frac{5}{8} \div 3\frac{5}{8} =$ .....

(15) 15 is what percent of 120? .....%.

(16) What percent of 112 is 42? .....%.

(17) $2\frac{3}{4}$ miles = ... rd.

(18) At .621 miles to the kilometer, 500 kilo. = ...mi.

(19) At $12\frac{1}{2}$ to the dollar, how many pesos are in 96 dollars? ..... pesos.

*(20) $52^3 =$ .....

(21) If 51 men do a job in 255 days, at the same rate, how long will it take 17 men? .....days.

(22) How many distinct sums of exactly two of the numbers 1, 2, 3, 4 are there? .....

(23) If $2^x = 1$, then $x =$ .....

(24) What is the sum of the coefficients in the expansion of $(a+b)^5$? .....

(25) If the angles of a triangle are x°, 2x°, and 3x°, what is the size of the smallest angle? .....°.

(26) If my shoe is $11\frac{1}{2}$" long and in a standing jump I jumped eleven shoe lengths, how far did I jump? .....ft.

(27) $2\frac{2}{3} \times 3\frac{5}{8} =$ .....

(28) If a 4' tree grows successively 24", 36", 61", and 52" per yr., what is its height after four years? .....ft.

(29) A tree has 10 leaves. After one year it has $F = 10^2 + (2 \times 10) - 1$ leaves. After two years it has $S = 10F + 7$ leaves. $S =$ .....

*(30) $129^2 - (17 \times 129) + 116 =$ .....

(31) $129^2 - (4 \times 129) - 5 =$ .....

(32) At 50 lb. per bu., what is the weight of 126 bu. potatoes? ..... lb.

(33) At 5 cu. ft. corn-in-the-shuck to the bushel, a 4' × 12' × 16" wagon bed of corn-in-the shuck holds .....bu.

(34) Find the interest for 1 yr. at $5\frac{1}{2}\%$ on \$10,250. \$.....

(35) How many primes are between 140 and 150? .....

(36) Find the number of divisors of $2^3 \times 3^2 \times 5$. .....

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

(38) What is the least common denominator: 1/14, 1/15, 1/6? .....

(39) The largest divisor of 210 less than 210 is .....

*(40) The product of the primes between 10 and 20 is .....

(41) If 40 hens lay 48 eggs in 2 days how many eggs will 30 hens lay in 1 day? .....eggs.

(42) $127 + 136 + 201 =$ .....

(43) $180 \times 3\frac{7}{8} =$ .....

(44) $180 \div 3\frac{7}{8} =$ .....

(45) $(180 + 5) + (30 + 1) =$ .....

(46) How many 20' rails does it take to lay a five mile two-rail track? .....

(47) $\{1, 2, 3\} \cap (\{2, 3, 4\} \cup \{2, 5, 6\}) = \{$.....$\}$.

(48) $(\{1, 2, 3\} \cap \{2, 3, 4\}) \cup (\{2, 3, 1\} \cap \{2, 5, 6\}) = \{$.....$\}$.

(49) $(\{1, 2, 3\} \cap \{2, 3, 4\}) \cup \{2, 5, 6\} = \{$.....$\}$.

*(50) $27 \times 29 \times 31 \times 33 =$ .....

(51) $(\{1, 2, 3\} \cup \{2, 5, 6\}) \cap (\{1, 2, 3\} \cup \{2, 3, 4\}) = \{$.....$\}$.

(52) The number of elements in the power set for $\{1, 2, 3\} \times \{2, 3, 4\}$ is .....

(53) The number of days from Sept. 21, 1956 to February 21, 1957 was ..... days.

(54) At \$1.75 per hr., how long will it take to make \$133? .....hr.

(55) $7\frac{1}{2} \div 1\frac{3}{4} =$ .....

(56) The number of elements in the power set for $\{1, 2, 3, 4, 5\}$ is .....

(57) If P is the power set for $\{1, 2, 3\}$, and Q is the power set for $\{2, 3, 4\}$, the number of elements in $P \times Q$ is .....

(58) $2\frac{1}{2} + 1\frac{2}{3} - 2\frac{2}{3} =$ .....

(59) $75 \div 2\frac{1}{2} =$ .....

*(60) The cost of 721 A. land at \$225 per A. is \$.....

(61) 3840 yd. = ... mi.

(62) 57 pk. = ... bu.

(63) 33 = 55% of .....

(64) Two adjacent angles of a trapezoid are each 90°, while a third is 30°. The number of degrees in the fourth is .....°.

(65) If the interest on a sum at 4% for 6 yr. was \$240, the sum was \$.....

(66) Write the larger cost: seven gal. gas at $28\frac{1}{2}$¢; 8 gal. gas at $25\frac{1}{2}$¢. \$.....

(67) The tax on 8,000,000 gal. gas at $8\frac{1}{2}$¢ per gal. is \$.....

(68) $18\ 6/7 \div 6 =$ .....

(69) If a triangle has sides 14′, 48′, and 50′, what is the length of the projection of the 14′ side on the 50′ side? .....ft.

*(70) $(16 \times 19) + (210 \times 23) =$ .....

(71) If $2^x = 2 \times 4 \times 8 \times 16 \times 64$, then x = ...

(72) The next integer in the sequence 3, 6, 11, 18, 27, 38, . . . is .....

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

(74) How many degrees are in each exterior angle of a regular pentagon? .....°.

(75) If a board ft. is the equivalent of $1'' \times 12'' \times 12''$, how many board ft. are in the order: three hundred 2×4's 18′ long? ..... bd. ft.

(76) The smaller angle between two radii of a circle is 40°. What is the ratio of the area of the smaller sector to that of the larger? .....

(77) After a $16\frac{2}{3}$% raise, John made \$724.50. What did he make before the raise? \$.....

(78) If the perimeter of a square is increased from 20″ to 24″, the area is increased by .....sq. in.

(79) $82^2 - 78^2 + 71^2 - 69^2 =$ .....

*(80) If x = 78, then $x^2 - 7x + 12 =$ .....

The University of Texas Interscholastic League

Number Sense Test, Series Z-8

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 the 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) $14 \times 15 =$ .....

(2) $32 \times 7/24 =$ .....

(3) $165 \div 15 =$ .....

(4) $63 + 75 =$ .....

(5) 28.5 is what percent of 1140? .....%.

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

(7) $7/8 - 5/12 =$ .....

(8) $12.62 + 8.21 =$ .....

(9) $35 \times 11 =$ .....

*(10) $37 \times 526 =$ .....

(11) 62 doz. = ...eggs.

(12) 196 in. = ...yd.

(13) 5 mi. = ...rd.

(14) $22\frac{1}{2}\%$ = ...(fraction).

(15) $714 = 87\frac{1}{2}\%$ of .....

(16) 7/12 = ...%.

(17) 70% of 623 = ...

(18) $16 + 18 - 12 =$ .....

(19) $75 \times 75 =$ .....

*(20) $5 \times 7 \times 11 \times 13 =$ .....

(21) Find the interest on $526 for 2 yr. at 6%. $.....

(22) How much should be invested for $1\frac{1}{2}$ yr. at 8% in order to yield $2400? $.....

(23) Find the tax on 7,327,622 gal. gas at 8¢ per gal. $.....

(24) At 25¢ on the $100 what is the tax on a farm valued at $12000? $.....

(25) If the government pays $8 per acre to Mr. Jones for allowing 120 acres to lie fallow, how much did it pay him? $.....

(26) $133\frac{1}{3} \times 1515 =$ .....

(27) $28 \times 32 =$ .....

(28) $27\ 3/7 \div 3 =$ .....

(29) If the sides of a triangle are 5", 12", and 13", what is the length of the projection of the short leg on the hypotenuse? ..... in.

*(30) What percent larger is 622 than 500? .....%.

(31) If a rectangular trough has its length and width doubled with the depth remaining the same, its volume is multiplied by .....

(32) A trapezoid has x as one base and 2x as its altitude. If both bases are doubled while the altitude remains fixed, the area is multiplied by .....

(33) How many degrees are in each exterior angle of a regular pentagon? .....°.

(34) Find the next term of 1, 2, 4, 6, 10, 12, 16, ...

(35) What is the sum of two numbers which satisfy $2x^2 - 3x + 7 = 0$? .....

(36) What is the largest prime less than 100? .....

(37) Which is the larger, 19/17 or 21/19? .....

(38) What is the least common denominator: 1/33, 1/35, 1/6? .....

(39) Find the number of divisors of $2^2 \times 4 \times 5$. .....

*(40) $7 \times 11 \times 13 \times 17 =$ .....

(41) Find the sum of the divisors of $2^2 \times 3 \times 5$. .....

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

(43) How many elements are in the power set for the set of primes between 10 and 20? .....

(44) If $A \times B$ is the Cartesian product of A and B, then $A \cap (A \times B)$ has how many elements in it? .....

(45) The altitude of a triangle of area 721 sq. in. is 30 in. Find the base. .....

(46) $\{0, 1, 2\} \cup (\{1, 2, 3\} \cap \{1, 2, 3, 4\}) = \{$.....$\}$.

(47) $(\{0, 1, 2\} \cup \{1, 2, 3\}) \cap (\{0, 1, 2\} \cup \{1, 2, 3, 4\}) =$ $\{$..... .....$\}$.

(48) A rectangular parallelepiped has two edges multiplied by 3/2. The

other remains fixed, and the figure is still a parallelepiped. What is the volume multiplied by? .....

(49) $33\frac{1}{3}\%$ of $37\frac{1}{2}\%$ of 896 = ...

*(50) The largest possible right circular cylinder is cut from a cube of volume 1000 cu. in. The volume of the cylinder is ..... cu. in.

(51) A circular floor is divided into three sectors by radii. How many ways can it be painted so as to use all three of three colors of paint? .....

(52) If $6 + 2x = x + 10$, then $x =$ .....

(53) What is the exact number of days from January 1, 1964 to June 1, 1964? .....days.

(54) At $12\frac{1}{2}$ pesos to the dollar, how many pesos are in \$188? ..... pesos.

(55) What is the difference of the areas of two circles of radii 5″ and 2″. ..... pi sq. in.

(56) $12\frac{1}{2}\% \times 37\frac{1}{2}\% \times 192 =$ .....

(57) The short side of a 30° right triangle is $5\frac{1}{2}$″. The hypotenuse is .....″.

(58) $62 \times 58 =$ .....

(59) John is twice as old as Tom. Five years ago he was three times as old as Tom. How old is Tom? .....yr.

*(60) The largest possible sphere is cut from a cube. what is the percent cut away? .....%.

(61) $2\frac{3}{8} - 1\frac{5}{8} =$ .....

(62) \$175 × 21 = \$.....

(63) If the edge of a regular tetrahedron is $\sqrt{6}$″, the altitude is ..... in.

(64) $2\frac{1}{2} \times 3\frac{1}{5} =$ .....

(65) If 120 acres are enough to graze 75 cows, at the same rate how many acres will it take to graze 125 cows? .....A.

(66) $175 \times 27 =$ .....

(67) A recipe calls for $3\frac{1}{2}$ cups of flour. If the recipe is tripled, how many cups of flour will it take? .....cups.

(68) What is the total surface area of a cylindrical can 8″ high and 5″ in diameter? .....pi sq. in

(69) At \$2.50 an oz., how much will 1 lb. blue bonnet seeds cost? \$.....

*(70) At 8 lb. per gal. and $7\frac{1}{2}$ gal. per cu. ft., what is the weight of water in a full cylindrical tank 5 ft. high and 6 ft. in diameter, ... lb.

(71) A sail boat traveling at the rate of $6\frac{1}{2}$ miles per hour went 132 miles. How long did it take? .....hr.

(72) $1.9 \times 1.9 =$ .....

(73) $28 \times 28 =$ .....

(74) $32^2 - 28^2 =$ .....

(75) $9^3 - 7^3 =$ .....

(76) $28^2 - (5 \times 28) + 6 =$ .....

(77) If $28^x = 1$, then $x =$ .....

(78) How many solutions does $\sqrt{5 - x^2} = -3$ have? .....

(79) A line from P intersects a circle in A and B so that PB = 8′. A tangent from P is 4′ long. The length of PA = ...ft.

*(80) $59^3 =$ .....

The University of Texas Interscholastic League

NOTE: If error is found in this Key, grade by the correct answer. Also, please report any error to the State Office, Box 8028, University Station.

Key to Number Sense TEST SERIES Z-1

1. 31
2. 162
3. 40
4. 182
5. 3
6. 484 sq. ft.
7. 4 8/31
8. 14
9. 243 sq. ft.
10. $74.29–$82.11
11. 75 5/6
12. 22 3/4
13. 16 1/4
14. 24 1/2
15. $13
16. 1,875,000
17. 57/200
18. 60.7
19. 6000
20. 1575–1742
21. 14 2/7 or 142.9
22. 150 hrs.
23. $1.95
24. 3 1/36 yd.
25. pi
26. 10 1/2 lb.
27. 3/16
28. 18,225
29. 60 loads
30. 106,875–118,125 gal.
31. $14.40
32. $2200
33. 61 bu.
34. 139
35. 6.8 sq. in.
36. 40.8 sq. in.
37. 6
38. 4
39. 24
40. $24.24–$26.80
41. $325.00
42. 60
43. 6
44. 90
45. 165
46. 312 1/2 pesos
47. 51%
48. 27 oz.
49. 2
50. 12.9–14.4 ft.
51. {1, 2}
52. {1}
53. 2
54. 8
55. {0, 1, 2}
56. {0, 1, 2}
57. 5/16
58. 173/900
59. 126
60. 29.07–32.13
61. 112 1/2 gal.
62. 75 gal.
63. 56 1/4%
64. 441 sq. ft.
65. 18
66. 12
67. $8.93
68. $870
69. $84
70. 6033–6669
71. 1/2
72. 80
73. 4 6/7 hr.
74. $11500
75. 8 yr.
76. 8 yr.
77. $816
78. 870 min.
79. $18.75
80. 355.3–392.8

Key to Number Sense TEST SERIES Z-2

1. 136
2. 7830
3. 3 2/3
4. 8 1/3
5. 19/60
6. 43 3/4%
7. 3.23
8. 4
9. 44
10. 11,448–12,653
11. 6
12. 170
13. 116 2/3%
14. 9800
15. 13,225
16. 8091
17. 11 1/2
18. 4.774
19. 121
20. 1,343,786–1,485,238
21. 7 7/87
22. 11
23. 49
24. 154
25. 188 pt.
26. $170
27. 1.73
28. 30 cu. yd.
29. 21%
30. 360–399
31. 101
32. $30
33. 5050
34. 36
35. 60
36. two or 2
37. 108
38. 149 days
39. 1968
40. 40–45
41. 6160 yd.
42. 403 hr.
43. 1 oz.
44. 10 in.
45. 80c
46. $122.40
47. 15
48. —4
49. —2
50. 27.3%–30.3% or 273–303
51. one or 1
52. eight or 8
53. A
54. A
55. B
56. fifteen or 15
57. six or 6
58. 10
59. six or 6
60. 19,630–21,698
61. 8
62. 4
63. $1102.50
64. 45
65. 510 mi.
66. 1 12/13 ft
67. 60 hr.
68. 15 days
69. 11/14
70. 384–426
71. 1763
72. 9 days
73. 405 gal.
74. 875 sq. ft.
75. 6873
76. $165
77. 20 yr.
78. 14 2/7%
79. 750
80. 82,080–90,720 sec.

Key to Number Sense TEST SERIES Z-3

1. $2.17
2. 174
3. 10 yd. 2 ft.
4. 24.04
5. 132 ft.
6. 130
7. 20 ft.
8. 56
9. 1521
10. 16.1–17.9
11. 9
12. 899
13. 533 1/3
14. 229
15. 385
16. 258
17. 1530
18. 1250
19. 28
20. 10.6–11.8
21. 8
22. 8%
23. 59/300
24. 71 3/7%
25. 384
26. 336 7/8
27. 38%
28. 4899
29. 322 7/8
30. 116–130 ft.
31. 3600
32. 28/32 or 7/8
33. 15
34. $1380
35. 400 sq. ft.
36. 97
37. 182
38. 720
39. 120
40. $694.83–$767.97
41. 36
42. 8
43. 4
44. 10 ft.
45. 1 in.
46. 5 yr.
47. —1/3
48. $50
49. 3 3/8
50. 909–1006
51. ϕ
52. A
53. {2, 3}
54. 32
55. {2, 3}
56. {2}
57. 3 1/5 in.
58. six or 6
59. nine or 9
60. 7643–8449
61. 10 7/12
62. 55 5/9%
63. 522 1/2
64. 529
65. —1
66. $4242
67. $183.40
68. 11 1/4
69. $10,625
70. 19,630–21,698
71. 60 days
72. 7
73. 11
74. 2
75. 25
76. 52
77. $200,000
78. $400,000
79. 1000
80. 3568–3944

Key to Number Sense TEST SERIES Z-4

1. 1207
2. 544
3. 675
4. 1568
5. 3 1/2
6. 44
7. 508
8. 13,200
9. 248 12/13
10. 9,479–10,478 cu. ft.
11. 49 7/9
12. 21 7/12
13. 8096
14. 6.37
15. 38 6/13%
16. 104
17. 127–400
18. 202 1/2%
19. $25.56
20. 171,171–189, 189
21. 12 sq. in.
22. 84 sq. ft.
23. 40°
24. 540 lb.
25. 42
26. 11
27. 343
28. 841
29. 21,025
30. 366,948–405,576
31. three or 3
32. 11
33. —2
34. 12
35. 8
36. 96
37. 4
38. 8 9/20
39. 10
40. 7274–8041
41. 1 1/9
42. 4 7/24
43. 3 1/2%
44. 101,025,000
45. $8.97
46. 437 1/2 or 437.5 or 437.50 pesos
47. 166 2/3%
48. 2835
49. 3 ft.
50. 66–75 gal.
51. 44
52. 132 ft. per sec.
53. {0, 1, 2, 3}
54. {1, 2}
55. {2, 3}
56. 64
57. 32
58. —66.76
59. 17/300
60. 193–215 cu. in.
61. 459
62. 8 in.
63. 279 mi.
64. 5
65. $12.25
66. $12
67. 30
68. 13 3/4
69. 11.25
70. 1.91–2.12
71. 1624
72. {0, 1, 2, 3}
73. 3600
74. $175.50
75. 12 hr.
76. 24
77. 7242
78. 68
79. 11
80. 56,353–62,285

Key to Number Sense TEST SERIES Z-5

1. 518
2. 273
3. 609
4. 7225
5. 8096
6. 805
7. 10 7/12
8. 43 3/4%
9. 33/200
10. 10,840–11,982
11. 116 2/3%
12. 3/8
13. 8
14. 6
15. 16.75
16. 891
17. 8/105
18. seven or 7
19. 26400 ft.
20. 348,368–385,040
21. 110 ft. per sec.
22. 1000 kilo.
23. $2.50
24. 1767
25. $250
26. $1720
27. $8.50
28. 80 hr.
29. $950
30. $138.20–152.75
31. 21/31
32. 16 2/3% or 166.6
33. 3 yd.
34. 2430 gal.
35. 108 sq. ft.
36. $266.67–$266.66 2/3
37. 3
38. 19
39. 9
40. 242,272–267,776
41. 217
42. 40
43. 1617
44. two or 2
45. 16
46. 16
47. —4
48. two or 2
49. five or 5
50. 70–78
51. {a, b}
52. {a, b}
53. {a, b, c}
54. {a, b, c}
55. —2
56. 16
57. —10
58. 124
59. 2197
60. 98,631–109,015
61. 132,651
62. 27
63. 27
64. $262.50
65. 75%
66. 3
67. 14 1/16 sq. in.
68. 72
69. 45 in.
70. 201.8–223.1
71. 35 sq. in.
72. 135°
73. 50 yr.
74. 6
75. 186 1/3 doz.
76. 10 1/8
77. 6 days
78. 33 1/3%
79. 1085
80. 638–706

Key to Number Sense TEST SERIES Z-6

1. 7
2. 248
3. 275
4. 8 17/24
5. 9750
6. 4 2/11
7. 35
8. 7680 A.
9. 230 2/5
10. 810,551–895,873
11. 283 1/3%
12. 143/500
13. 324 cu. ft.
14. 2 4/9
15. 2280
16. 5625
17. 1600
18. 4000
19. 9 17/25
20. 5341–5905
21. 51 3/7 min.
22. 121 days
23. 5 1/3 A.
24. 3
25. $1250
26. 3
27. $187.34
28. $4.16
29. 50 mi. per hr.
30. $39.23–$43.37
31. 34
32. —2
33. 2
34. 5 in.
35. 120°
36. 40 sq. in.
37. 1/4
38. 4 in.
39. —6
40. 13,200–14,590
41. $19.20
42. 61 13/47 min.
43. 187
44. 6
45. 336
46. 94
47. 67,500
48. 181
49. 1
50. 1,023,717–1,131,478
51. 330
52. 6
53. 2
54. $88.50
55. 10,500
56. {1, 2}
57. {1, 2, 3}
58. {0, 1, 2, 3}
59. {1, 2, 3}
60. 328–363
61. 128
62. 10
63. $2.70
64. 900
65. 105 yr.
66. 70 yr.
67. 6
68. $9000
69. 2 1/2 da.
70. 4788–5293
71. 24 times
72. 96%
73. $60
74. 5 1/4
75. $93
76. $7.80
77. 19 7/12
78. 5675
79. 10,500
80. $27.98–$30.94

Key to Number Sense TEST SERIES Z-7

1. 510
2. 70
3. —1 1/6
4. 2 2/7
5. 343
6. 676
7. 899
8. 6300
9. 3/125
10. 2,585,101–2,857,217
11. 38 6/13%
12. $162
13. 8983
14. 23 18/29
15. 12 1/2%
16. 37 1/2%
17. 880 rd.
18. 310.5 mi.
19. 1200 pesos
20. 133,577–147,639
21. 765 days
22. 5 or five
23. zero or 0
24. 32
25. 30°
26. 10 13/24 ft.
27. 9 2/3
28. 18 5/12 ft.
29. 1197
30. 13,835–15,293
31. 16,120
32. 6300 lb.
33. 12 4/5 bu.
34. $563.75
35. 1 or one
36. twenty-four or 24
37. ninety-six or 96
38. 210
39. 105
40. 43,879–48,499
41. 18 eggs
42. 464
43. 660
44. 49 1/11
45. 216
46. 2640
47. {2, 3}
48. {2, 3}
49. {2, 3, 5, 6}
50. 760,958–841,060
51. {1, 2, 3}
52. five hundred twelve or 512
53. one hundred fifty-three or 153
54. 76 hr.
55. 4 2/7
56. thirty-two or 32
57. sixty-four or 64
58. 1 1/2
59. 30
60. $154,113–$170,337
61. 2 2/11 mi.
62. 14 1/4 bu.
63. 60
64. 150°
65. $1000
66. $2.04
67. $680,000
68. 3 1/7
69. 3 23/25 ft.
70. 4877–5391
71. 16
72. 51
73. 6
74. 72°
75. 3600 bd. ft.
76. 1/8
77. $621
78. 11 sq. in.
79. 920
80. 5272–5828

Key to Number Sense TEST SERIES Z-8

1. 210
2. 9 1/3
3. 11
4. 138
5. 2 1/2% or 2.5%
6. 8 1/6
7. 11/24
8. 20.83
9. 385
10. 18,488–20,436
11. 744 eggs
12. 5 4/9 yd.
13. 1600 rd.
14. 9/40
15. 816
16. 58 1/3%
17. 436.1
18. 22
19. 5625
20. 4754–5256
21. $63.12
22. $20,000
23. $586,209.76
24. $30
25. $960
26. 202,000
27. 896
28. 9 1/7
29. 1 12/13 in.
30. 23.1%–25.7%
31. 4
32. 2
33. 72°
34. 18
35. 1 1/2
36. 97
37. 19/17
38. 2310
39. 10 or ten
40. 16,166–17,868
41. 168
42. sixteen or 16
43. sixteen or 16
44. none or zero or 0
45. 48 1/15
46. {0, 1, 2, 3}
47. {0, 1, 2, 3}
48. 2 1/4
49. 112
50. 746–826
51. six or 6
52. 4
53. 152 or one hundred fifty two
54. 2350 pesos
55. 21 pi sq. in.
56. 9
57. 11 in.
58. 3596
59. 10
60. 45.2%–50.1%
61. 13/24
62. $3675
63. 2 in.
64. 9 1/2
65. 200 acres
66. 4725
67. 10 1/2
68. 52 1/2 pi sq. in.
69. $40
70. 8058–8908 lb.
71. 20 4/13 hr.
72. 3.61
73. 784
74. 240
75. 386
76. 650
77. 0
78. zero or none or 0
79. 2'
80. 195,110–215,648