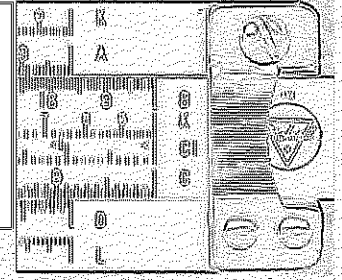
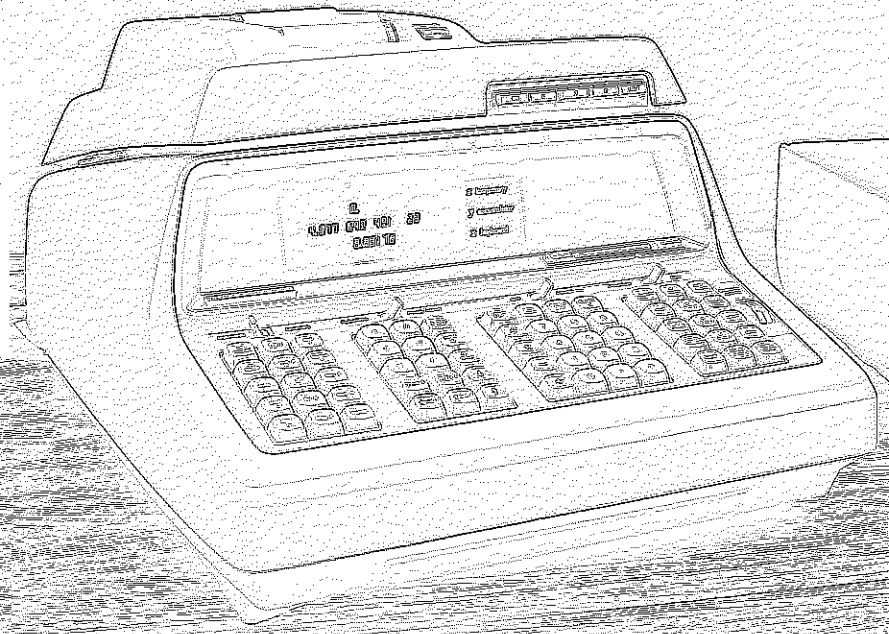
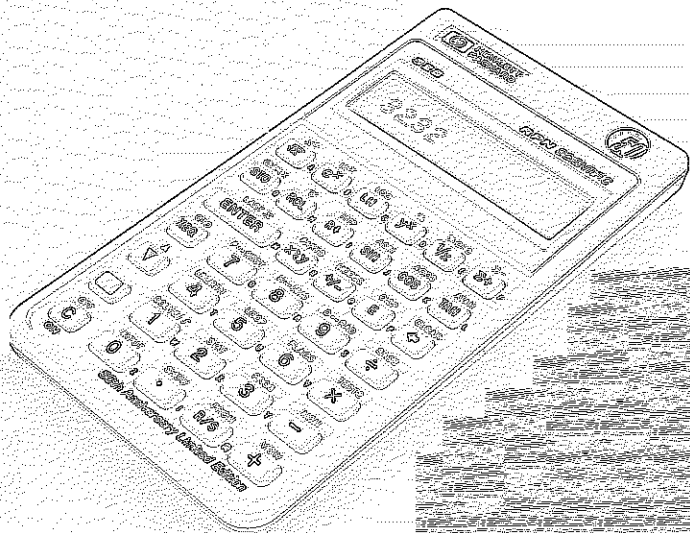
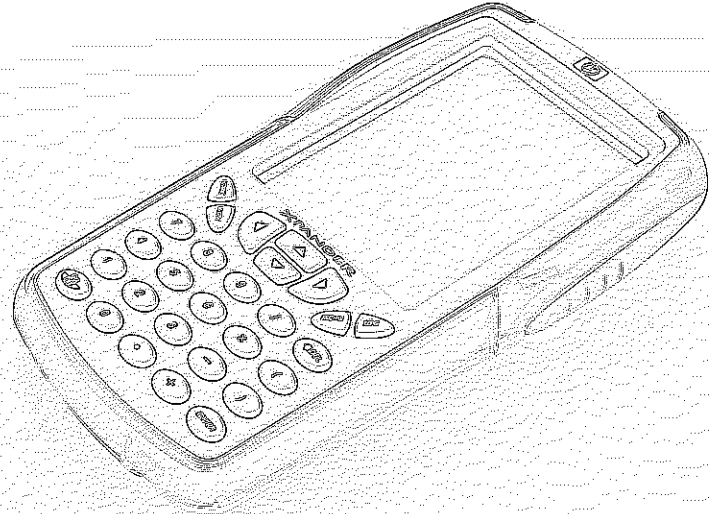
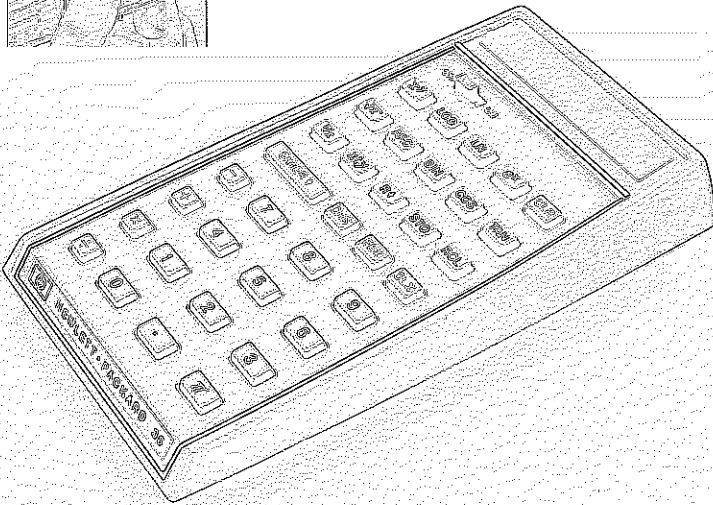
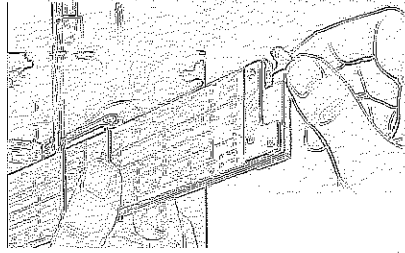
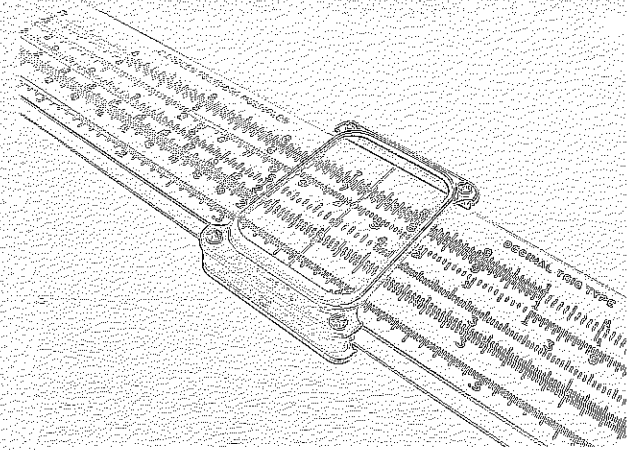
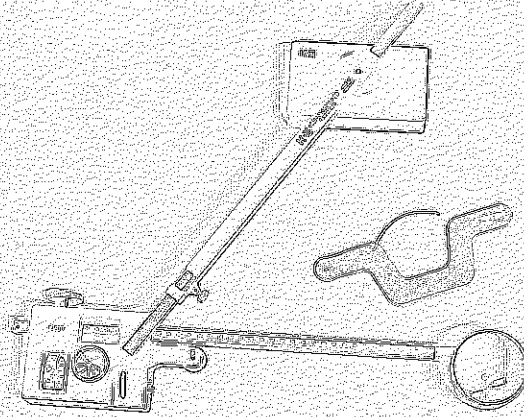
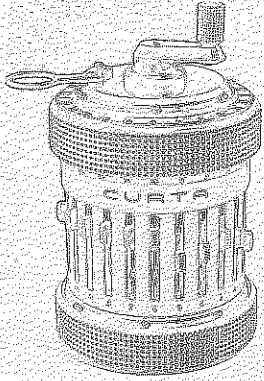


**Texas Competitive Mathematics**  
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**1972-73 UIL Number Sense  
(14 pages)**



# The University of Texas Interscholastic League

## Number Sense Test, Series FF-1

Contestant's Number.....

Contestant's Score.....

**Read Directions Carefully  
Before Beginning Test**

**Do not Unfold This Sheet  
Until Told to Begin**

*Directions:* Do not turn this page until person conducting this test gives the signal to begin. This is a ten-minute test. There are 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 answers 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

- |   |  |
|---|--|
| <p>(1) <math>3^5 =</math> .....</p> <p>(2) <math>19 + 37 - 14 =</math> .....</p> <p>(3) <math>218 - 27 =</math> .....</p> <p>(4) <math>12(8) + 12(16) =</math> .....</p> <p>(5) <math>16^2 =</math> .....</p> <p>(6) <math>1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 + 12 =</math> .....</p> <p>(7) <math>65^2 =</math> .....</p> <p>(8) <math>57 \times 63 =</math> .....</p> <p>(9) <math>7^3 - 2^3 =</math> .....</p> <p>* (10) <math>25^3 + 75 =</math> .....</p> <p>(11) <math>4/3 \times 1\frac{1}{2} =</math> .....</p> <p>(12) <math>7\frac{1}{2} \div 5 =</math> .....</p> <p>(13) <math>1\frac{1}{4} \div 3/7 =</math> .....</p> <p>(14) <math>1\frac{1}{8} \times 39 =</math> .....</p> <p>(15) The least common denominator for <math>5/6, 1/15, 3/4</math> is .....</p> <p>(16) Reduce <math>39/52</math> to lowest terms. ....</p> <p>(17) <math>2\frac{1}{2} - 3\frac{1}{8} + 1\% =</math> .....</p> <p>(18) <math>2\frac{1}{2} \times 3\frac{1}{2} \times \% =</math> .....</p> <p>(19) The largest of <math>3/5, 10/15, 24/35</math> is .....</p> <p>* (20) <math>47 \times 187,000 =</math> .....</p> <p>(21) <math>83\frac{1}{3}\% =</math> ..... (fraction).</p> <p>(22) <math>22/300 =</math> ..... %.</p> <p>(23) <math>62\frac{1}{2}\%</math> of 96 = .....</p> <p>(24) <math>14 \div 28 \frac{4}{7}\% =</math> .....</p> <p>(25) <math>1\frac{1}{2}</math> is what per cent of 5? ..... %.</p> <p>(26) <math>22 \frac{2}{9}\%</math> of what number is 6? .....</p> <p>(27) <math>33\frac{1}{3}\%</math> of <math>66\frac{2}{3}\%</math> of 48 = .....</p> <p>(28) A \$64 lawn mower, after a <math>37\frac{1}{2}\%</math> discount, sold for \$.....</p> | <p>(29) \$800, less <math>37\frac{1}{2}\%</math> of \$800, less <math>33\frac{1}{3}\%</math> of <math>37\frac{1}{2}\%</math> of \$800 = \$.....</p> <p>* (30) <math>52\%</math> of 21,000 = .....</p> <p>(31) Change 56, base 7, to base 10; .....</p> <p>(32) The remainder in base 8 when 81785, base 8, is divided by 8 is .....</p> <p>(33) The least common multiple of 6, 14, and 21 is .....</p> <p>(34) The greatest common divisor of 35 and 42 is .....</p> <p>(35) The number of positive integral divisors of 245 is .....</p> <p>(36) The sum of the positive integral divisors of 52 is .....</p> <p>(37) What is the remainder when <math>7^8</math> is divided by 12? .....</p> <p>(38) How many primes are there between 70 and 80? .....</p> <p>(39) How many integers greater than or equal to one and less than or equal 18 are relatively prime to 18? .....</p> <p>* (40) <math>9 \times 10 \times 11 \times 12 \times 13 =</math> .....</p> <p>(41) If the surface of a cube is multiplied by 4, the volume of the original cube is multiplied by what to form the new cube? .....</p> <p>(42) If the sum of three consecutive integers is 42, the smallest is .....</p> <p>(43) An octahedron has how many faces? .....</p> <p>(44) The third term in the expansion of <math>(t + 3)^8</math> is .....t.</p> <p>(45) If 10 less than 3 b is 17, then b = .....</p> <p>(46) If it takes Tom two days to do a job which requires three days for Joe, at the same rate, how long will it take both? .....days.</p> <p>(47) Find the circumference of a circle of radius 14 in. (use <math>\pi = 22/7</math>). ..... in.</p> <p>(48) If <math>-2x + 3 \geq 5</math>, then the largest possible value of x is .....</p> <p>(49) Find k so that the roots of <math>3x^2 - 3x + k = 0</math> are equal .....</p> <p>* (50) The surface area of a cube whose volume is 125000 cu. in. is ..... sq. in.</p> <p>(51) The distance between (5,9) and (-3,24) is .....</p> |
|---|--|

- (52) The slope of the line through (5,9) and (-3,24) is .....
- (53) The x value of the midpoint (x,y) of the line segment from (5,9) to (-3,24) is .....
- (54) The radius of the circle  $x^2 - 10x + y^2 + 24y = 0$  is .....
- (55) If  $\log_b 81 = 4$ , then  $b =$  .....
- (56) If  $n = 2.141414 \dots$  then  $n =$  ..... (mixed number)
- (57) The slope of the line  $3y + 5x - 7 = 0$  is .....
- (58) The number of elements in the power set for  $\{0, 1, 2,\}$  is .....
- (59) The next term of 1, 2, 4, 7, 11, ... is .....
- \* (60) If  $\log_{10} n = 3.55011$ , then  $n =$  .....
- (61) If Tom drives a distance  $d$  at 20 miles per hour one way and at 30 miles per hour on his return, his average rate was.....m.p.h.
- (62) If  $2(2-\sqrt{3}) - \sqrt{3}(2-\sqrt{3}) = 7 + a\sqrt{3}$ , then  $a =$  .....
- (63) The second term of  $(2a - 3b)^3$  is ..... $a^2b$ .
- (64) If  $a^2 > 9$  and  $a$  is negative, then  $a$  must be less than .....
- (65) If  $a^2 > 9$  and  $a$  is positive, then  $a$  must be greater than .....
- (66) What is the largest value of  $a$  such that  $x^2 + x + a = 0$  has only real roots? .....
- (67) If  $y = x^2$  and  $y - 5 = 4$  and  $x < 0$ , the  $x =$  .....
- (68) If  $2x^2 + 3x - 5 = 0$ , has roots  $r$  and  $s$ , then  $r + s =$  .....
- (69) The product of the roots of  $2x^2 + 3x - 5 = 0$  is .....
- \* (70) The number of acres in 120 sq. miles is .....A.
- (71) If  $a = k^2/b$  and  $a = 3$  when  $b = 4$ , then what is  $b$  when  $a = 7$ ?  $b =$  .....
- (72) If  $5/x = x/20$  and  $x < 0$ , then  $x =$  .....
- (73) How many planes are determined by six points, no four of which are in the same plane? .....
- (74) The next number of 1, 1, 2, 3, 5, 8, 13, 21, ... is .....
- (75) If a deck of 52 cards contains 4 deuces, what is the probability of drawing a deuce in a draw of one card? .....
- (76) The Arabic Numeral for MCDXCVIII is .....
- (77) At 8 gal. per bu. how many bushels are in 512 gal.? .....bu.
- (78) At 12.5 to the dollar, how many pesos are in 6.50 dollars? ..... pesos.
- (79) What is the altitude on the hypotenuse of a 5", 12", 13" right triangle? ..... in.
- \* (80) What is the total surface area of all the 1 inch cubes which can be put in a cube of edge 15? ..... sq. in.

# The University of Texas Interscholastic League

## Number Sense Test, Series FF-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 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 answers 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

- |  |  |
|--|--|
| <p>(1) <math>5^4 =</math> .....</p> <p>(2) <math>18 + 22 - 13 =</math> .....</p> <p>(3) <math>311 - 32 =</math> .....</p> <p>(4) <math>13(19 - 15) =</math> .....</p> <p>(5) <math>15^2 =</math> .....</p> <p>(6) <math>1 + 2 + 3 + \dots + 11 =</math> .....</p> <p>(7) <math>75^2 =</math> .....</p> <p>(8) <math>66 \times 74 =</math> .....</p> <p>(9) <math>9^3 - 1^3 =</math> .....</p> <p>* (10) <math>24^3 + 76 =</math> .....</p> <p>(11) <math>3\frac{1}{2} \times \frac{2}{3} =</math> .....</p> <p>(12) <math>3\frac{1}{2} \div 2\frac{1}{2} =</math> .....</p> <p>(13) <math>1\frac{5}{8} + 2\frac{3}{4} =</math> .....</p> <p>(14) <math>1\frac{5}{8} \times 42 =</math> .....</p> <p>(15) The least common denominator for <math>\frac{5}{6}, \frac{1}{14}, \frac{5}{12}</math> is .....</p> <p>(16) Reduce <math>\frac{84}{18}</math> to lowest terms. ....</p> <p>(17) <math>\frac{2}{3} - 1\frac{1}{8} + 3\frac{3}{4} =</math> .....</p> <p>(18) <math>\frac{1}{2} \times \frac{2}{3} \div 3\frac{1}{2} =</math> .....</p> <p>(19) Write the largest of <math>\frac{1}{7}, \frac{3}{14}, \frac{5}{42}</math>. ....</p> <p>* (20) <math>14 \times 87000 =</math> .....</p> <p>(21) <math>62\frac{1}{2}\%</math> = ..... (Fraction)</p> <p>(22) <math>11\frac{1}{2}\%</math> = ..... (Fraction)</p> <p>(23) <math>16\frac{2}{3}\%</math> of 124 = .....</p> <p>(24) <math>83\frac{1}{8}\% \div 100 =</math> .....</p> <p>(25) 3 is what per cent of <math>33\frac{1}{3}</math>? .....%</p> <p>(26) <math>37\frac{1}{2}\%</math> of what number is 96? .....</p> <p>(27) <math>66\frac{2}{3}\%</math> of <math>87\frac{1}{2}\%</math> of 24 is .....</p> <p>(28) If a 64¢ bag of fruit was reduced <math>37\frac{1}{2}\%</math>, it sold for .....¢.</p> <p>(29) A \$99 overcoat was reduced 22 <math>\frac{2}{9}\%</math> and then 25%. It sold for \$.....</p> <p>* (30) 13% of 21000 = .....</p> | <p>(31) If a 2 in. by 4 in. picture is enlarged to 4 in. by 8 in., its area is multiplied by .....</p> <p>(32) If <math>1 - 2x = x + 7</math>, then <math>x =</math> .....</p> <p>(33) If John's age in years is three times that of Mary, but his age will be twice that of Mary in five years, then Mary's age = .....</p> <p>(34) Find the area of a triangle with sides of 10", 13", and 13".<br/>.....</p> <p>(35) How heavy a log can Mr. B lift with his 200 lb. weight placed on the long end of a 20 ft. pole with fulcrum 1 ft. from log?<br/>..... lb.</p> <p>(36) If <math>(3 - 2x) - (2x + 4) = -1 + ax</math>, then <math>a =</math> .....</p> <p>(37) If <math>(2x + 3)(ax - 2) = 6x^2 + 5x - 6</math>, then <math>a =</math> .....</p> <p>(38) If <math>x^4 - 16 = (x - 2)(x + 2)(x^2 + b)</math> then <math>b =</math> .....</p> <p>(39) Find the sum of the first six terms of: <math>3 + 6 + 9 + \dots</math> .....</p> <p>* (40) How many times will an ordinary clock strike in 90 days if it strikes once on the half-hour and strikes the hour on the hour? .....</p> <p>(41) Change 321, base 4, to base two. ....</p> <p>(42) The greatest common divisor of 76 and 57 is .....</p> <p>(43) The least common multiple of 76 and 57 is .....</p> <p>(44) The sum of the positive integral divisors of 76 is .....</p> <p>(45) The number of positive integral divisors of 76 is .....</p> <p>(46) If <math>n = 6153</math> is in base 7, the remainder in base 7 when <math>n</math> is divided by <math>7^2</math> is .....</p> <p>(47) The number of positive integers between 1 and 27 inclusive which are relatively prime to 27 is .....</p> <p>(48) What is the remainder when <math>2^{12}</math> is divided by 7? .....</p> <p>(49) How many primes are between 45 and 55? .....</p> <p>* (50) <math>12 \times 11 \times 10 \times 9 \times 8 \times 7 =</math> .....</p> <p>(51) If 50 hens lay 100 eggs in 4 days, at the same rate, how many eggs will 25 hens lay in 8 days? ..... eggs.</p> <p>(52) 264 ft. per second is how many miles per hour? ..... m.p.h.</p> |
|--|--|

- (53)  $(\frac{1}{4})^{-3/2} =$  .....
- (54) How many subsets of three objects are in a set of five objects?  
.....
- (55) if  $x^2 > 36$  and  $x$  is a negative integer, then the largest value  $x$  can have is .....
- (56) How many distinct rational roots does  $4x^2 - 4x + 1$  have?  
.....
- (57) If  $2x + y = 5$  and  $x - y = 1$ , then  $y =$  .....
- (58) The sum of the roots of  $2x^3 + 3x^2 - 5 = 0$  is .....
- (59) The slope of the line through  $(2,4)$  and  $(-1,6)$  is .....
- \* (60)  $180^2 + 40 \times 50 =$  .....
- (61) Find the distance between  $(16,9)$  and  $(1,1)$ . .....
- (62) The slope of the line  $2x + 3y = 7$  is .....
- (63) The point  $(x,3)$ , with  $x < 0$  is on the circle  $(x-2)^2 + (y-3)^2 = 16$  if and only if  $x =$  .....
- (64) The radius of  $x^2 - 2x + y^2 - 6x = 6$  is .....
- (65) If  $(2,y)$  is one fourth the distance from  $(1,7)$  to  $(5,9)$  then  $y =$  .....
- (66) The next number of 3, 6, 12, 24, 48, . . . is .....
- (67) If  $\log_b 9 = 2$ , then  $b =$  .....
- (68)  $\log_3 9 + \log_3 27 =$  ..... (integer).
- (69) The number of elements in the power set for  $\{1, 2, 3, 4, 5\}$  is .....
- \* (70)  $182 \times 93 + 74 =$  .....
- (71) Write the Arabic Numeral for MDCCXXVIII. ....
- (72) At 12.5 pesos to the dollar, 90 pesos = .....dollars.
- (73) If  $4/x = x/9$  and  $x > 0$ , then  $x =$  .....
- (74) For which value of  $x$  is  $4/x$  meaningless?  $x =$  .....
- (75) If  $a = kb$  and  $a = 4$  when  $b = 9$ , find  $b$  when  $a = 9$ .  $b =$  .....
- (76) The smallest integer greater than each of 1.01, 1.0101, 1.010101 . . . . is .....
- (77) If  $a = k/b$  and  $a = 4$  when  $b = 9$ , find  $b$  when  $a = 9$ .  $b =$  .....
- (78) The remainder when 51792 is divided by 11 is .....
- (79) If  $48^2 + x^2 = 73^2$ , then  $x^2 =$  .....
- \* (80)  $21^3 + 39 =$  .....

# The University of Texas Interscholastic League

## Number Sense Test, Series FF-3

Contestant's Number.....

Contestant's Score.....

**Read Directions Carefully  
Before Beginning Test**

**Do not Unfold This Sheet  
Until Told to Begin**

*Directions:* Do not turn this page until person conducting this test gives the signal to begin. This is a ten-minute test. There are 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 answers 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

- |   |   |
|---|---|
| <p>(1) <math>6^3 =</math> .....</p> <p>(2) <math>97 - 15 + 32 =</math> .....</p> <p>(3) <math>96 - 357 =</math> .....</p> <p>(4) <math>27 \times 17 - 18 \times 17 =</math> .....</p> <p>(5) <math>21^2 =</math> .....</p> <p>(6) <math>11 + 12 + 13 + 14 + 15 + 16 + 17 =</math> .....</p> <p>(7) <math>95^2 =</math> .....</p> <p>(8) <math>88 \times 92 =</math> .....</p> <p>(9) <math>(9 - 1)^3 =</math> .....</p> <p>* (10) <math>23^3 + 33 =</math> .....</p> <p>(11) <math>1 \frac{2}{3} \times \frac{5}{7} =</math> .....</p> <p>(12) <math>2\frac{1}{2} \div 3\frac{1}{2} =</math> .....</p> <p>(13) <math>3\frac{1}{2} + 1 \frac{4}{9} =</math> .....</p> <p>(14) <math>2\frac{3}{4} \times 120 =</math> .....</p> <p>(15) The least common denominator for <math>\frac{1}{21}, \frac{1}{28}, \frac{1}{42}</math> is .....</p> <p>(16) Reduce <math>\frac{15}{63}</math> to lowest terms. ....</p> <p>(17) <math>-3 + 2\frac{1}{2} - 3\frac{3}{8} =</math> .....</p> <p>(18) <math>2\frac{1}{2} \times 3 \div 7\frac{1}{2} =</math> .....</p> <p>(19) The largest of <math>\frac{5}{6}, \frac{14}{18}, \frac{29}{31}</math> is .....</p> <p>* (20) <math>161 \times 8500 =</math> .....</p> <p>(21) <math>16\frac{2}{3}\% =</math> ..... (fraction).</p> <p>(22) <math>5\frac{3}{8}\% =</math> ..... (fraction).</p> <p>(23) <math>22 \frac{2}{9}\%</math> of 108 = .....</p> <p>(24) <math>100 \div 62\frac{1}{2}\% =</math> .....</p> <p>(25) 7 is what percent of 35? .....%</p> <p>(26) <math>2\frac{1}{2}\%</math> of what number is 7? .....</p> <p>(27) <math>87\frac{1}{2}\%</math> of <math>66\frac{2}{3}\%</math> of <math>\frac{12}{7}</math> is .....</p> <p>(28) After a <math>62\frac{1}{2}\%</math> discount a \$960 article sold for \$.....</p> <p>(29) <math>(14 \div 87\frac{1}{2}\%) \div 600\% =</math> .....</p> <p>* (30) 19% of 18000 = .....</p> <p>(31) Change 67, base 8, to base 6. ....</p> | <p>(32) The greatest common divisor of 28 and 98 is .....</p> <p>(33) The least common multiple of 28 and 98 is .....</p> <p>(34) The number of positive integral divisors of 30 is .....</p> <p>(35) The sum of the positive integral divisors of 30 is .....</p> <p>(36) If an integer in base b is divided by b-1, and the sum of its digits is divided by b-1, the same remainders are obtained. Find the remainder when 67154, in base 8, is divided by 7. ....</p> <p>(37) How many integers divisible by 7 are between 5 and 40? .....</p> <p>(38) How many integers between one and 30, inclusive, are relatively prime to 30? .....</p> <p>(39) Find the remainder when <math>11^4</math> is divided by 12. ....</p> <p>* (40) <math>(892 + 567) \times 860 =</math> .....</p> <p>(41) If all linear dimensions of a cylinder of steel are tripled, its weight is multiplied by .....</p> <p>(42) If <math>5 - 2x = 3x + 25</math>, then <math>x =</math> .....</p> <p>(43) How many degrees are in each interior angle of a regular pentagon? .....</p> <p>(44) If twice a number less three times the number equals the number, then it is .....</p> <p>(45) How much must one weigh to lift an object of 1000 lb. with a pole 10 ft long and fulcrum one foot from the object?..... lb.</p> <p>(46) If <math>x^2 - y^2</math> is factored and these factors are added and their sum is <math>ax + by</math>, then <math>b =</math> .....</p> <p>(47) If <math>(x + y)(x^2 + 2xy + y^2) = x^3 + 3x^2y + axy^2 + y^3</math>, then <math>a =</math> .....</p> <p>(48) If <math>i^2 = -1</math>, then <math>(i - 1)(i + 1) =</math> .....</p> <p>(49) The sum of the first five terms of <math>1 + 3 + 3^2 + 3^3 + \dots</math> is .....</p> <p>* (50) <math>(96 + 27)(96 - 27) + 13 =</math> .....</p> |
|---|---|

- (51) If pipe a fills a tank in 2 hours and pipe b fills it in 5 hours, at their same rate, in how many hours will both fill it? ..... hours.
- (52) If 88 ft. per second is 60 miles per hour, 210 miles per hour is equivalent to ..... ft. per second.
- (53)  $8^{-2/3} =$  .....
- (54) The third term of  $(2a - b)^4$  is .....  $a^2b^2$ .
- (55) A secant from P intersects a circle at C and D so that  $PC = 2'$  and  $PD = 8'$ . The length of a tangent from P is ..... ft.
- (56) If  $x^2 \geq 189$  and  $x < 0$ , then the largest value x can have is .....
- (57) If  $x^2 + x + 1 = 0$  and  $x = \frac{-1 \pm C}{2}$ , then  $C^2 =$  .....
- (58) The sum of the roots of  $3x^2 + 4x - 2 = 0$  is .....
- (59) The product of the roots of  $3x^2 + 4x - 2 = 0$  is .....
- \* (60)  $(19)^4 + 79 =$  .....
- (61) The distance from (0,2) to (5,14) is .....
- (62) The slope of the line through (0,2) and (5,14) is .....
- (63) The y-intercept of  $2x + 3y + 5 = 0$  is .....
- (64) The y-value of the center of  $x^2 + 2x + y^2 - 2y = 2$  is  $y =$  .....
- (65) The radius of  $x^2 + 2x + y^2 - 2y = 2$  is .....
- (66) If (2,—3) bisects the line segment from (3,—2) to (x,y) then  $y =$  .....
- (67) Reduce the next term of  $\frac{1}{2} + \frac{2}{4} + \frac{6}{8} + \frac{24}{16} + \frac{120}{32} + \dots$  .....
- (68) If  $\log_5 x = 0$ , then  $x =$  .....
- (69)  $\log_3 \frac{1}{27} =$  .....
- \* (70)  $180 \times 320 \div 12 =$  .....
- (71) The arabic numeral for CDXCVIII is .....
- (72) How many subsets of two elements are there for a set of six elements? .....
- (73)  $.119119119 \dots =$  ..... fraction.
- (74)  $\frac{x^2}{5} = 1152/10$  and  $x < 0$ , then  $x =$  .....
- (75)  $40^\circ$  centigrade = .....  $^\circ$  fahrenheit.
- (76) What is the probability of horse A being first and horse B second in a race of 4 horses (assuming equal chances for all horses)? .....
- (77)  $1(1 - i) + i(1 - i) =$  .....
- (78) The total area of the surface of a regular hexahedron of edge  $2\sqrt{3}$  in. is ..... sq. in.
- (79) If  $K = ab$  and  $a = 5$  when  $b$  is 9, find  $a$  when  $b = 7$ . .....
- \* (80) At 2.54 cm. to the inch, the volume in cubic centimeters of a cubic inch is ..... c.c.

# The University of Texas Interscholastic League

## Number Sense Test, Series FF-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 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 answers 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

- |   |  |
|---|--|
| <p>(1) <math>8^3 =</math> .....</p> <p>(2) <math>99 + 56 - 14 =</math> .....</p> <p>(3) <math>87 + 129 =</math> .....</p> <p>(4) <math>19 \times 5 - 19 \times 11 =</math> .....</p> <p>(5) <math>17^2 =</math> .....</p> <p>(6) <math>1 + 2 + 3 + \dots + 100 =</math> .....</p> <p>(7) <math>85^2 =</math> .....</p> <p>(8) <math>78 \times 82 =</math> .....</p> <p>(9) <math>8^3 - 6^3 =</math> .....</p> <p>* (10) <math>22^3 + 52 =</math> .....</p> <p>(11) <math>5/9 \times 1\frac{1}{2} =</math> .....</p> <p>(12) <math>1\% \div \frac{1}{6} =</math> .....</p> <p>(13) <math>2\frac{1}{7} + 3\frac{1}{2} =</math> .....</p> <p>(14) <math>2\frac{5}{7} \times 21 =</math> .....</p> <p>(15) The least common denominator for <math>1/4, 3/14, 1/5</math> is .....</p> <p>(16) Reduce <math>28/42</math> to lowest terms. ....</p> <p>(17) <math>2\frac{1}{3} + 3\frac{1}{2} - 1\frac{1}{3} =</math> .....</p> <p>(18) <math>2\frac{1}{2} \times 3\frac{1}{2} \times \% =</math> .....</p> <p>(19) <math>5/2 \times 7/2 \div 5/4 =</math> .....</p> <p>* (20) <math>13 \times 9600 =</math> .....</p> <p>(21) <math>12\frac{1}{2}\% =</math> ..... (fraction).</p> <p>(22) <math>20/300 =</math> ..... %.</p> <p>(23) <math>18\frac{2}{11}\%</math> of 121 = .....</p> <p>(24) <math>36 \div 37\frac{1}{2}\% =</math> .....</p> <p>(25) 80 is what per cent of 180? ..... %.</p> <p>(26) <math>62\frac{1}{2}\%</math> of what number is 20? .....</p> <p>(27) <math>62\frac{1}{2}\%</math> of <math>33\frac{1}{3}\%</math> of what number is <math>55/8</math>? .....</p> <p>(28) After a <math>16\frac{2}{3}\%</math> reduction, a \$9.00 hat sold for \$.....</p> <p>(29) \$144 less <math>16\frac{2}{3}\%</math> less <math>16\frac{2}{3}\%</math> of <math>37\frac{1}{2}\%</math> of \$144 is \$.....</p> <p>* (30) <math>23\%</math> of 1800 = .....</p> | <p>(31) If a cube is enlarged so that the new cube has a volume of 64 times the original volume, its diagonal is multiplied by what?.....</p> <p>(32) In four years Tommy will be three times as old as he was two years ago. His age is ..... years.</p> <p>(33) If <math>4 - 3x = (2x + 7) \div 2</math>, then <math>x =</math> .....</p> <p>(34) The perimeter of an equilateral triangle of area <math>16\sqrt{3}</math> sq. in. is ..... in.</p> <p>(35) How far from the short end of a 16 foot pole must the fulcrum be placed for a 200 lb. man on the long end to lift 800 lb.? ..... ft.</p> <p>(36) <math>(a + b)(a^2 - ab + b^2) - (a^3 - b^3) =</math> .....</p> <p>(37) If <math>x(a^2 + b^2) + y(a^2 + b^2) = (ax + y)(a^2 + b^2)</math> then <math>a =</math> .....</p> <p>(38) If <math>(x^4 - y^4) \div (x - y)(x + y) = x^2 + by^2</math> then <math>b =</math> .....</p> <p>(39) <math>1 + 1/2 + 1/3 + 1/4 + 1/5 =</math> .....</p> <p>* (40) The volume of a square pyramid with base of side 27' and height of 180' is ..... cu. ft.</p> <p>(41) Change 111, base 4, to base 5. ....</p> <p>(42) The greatest common divisor of 38 and 57 is .....</p> <p>(43) The least common multiple of 38 and 57 is .....</p> <p>(44) The number of positive integral divisors of 57 is .....</p> <p>(45) The sum of the positive integral divisors of 57 is .....</p> <p>(46) The remainder, in base 8, when 716, base 8, is divided by 7 is .....</p> <p>(47) Write down an even prime .....</p> <p>(48) How many integers between 1 and 65 are positive integral powers of 2? .....</p> <p>(49) What is the remainder when <math>7^6</math> is divided by 48? .....</p> <p>* (50) <math>60 \times 7 \times 119 =</math> .....</p> <p>(51) If 12 hens lay 54 eggs in 6 days, at the same rate, how many eggs will 9 hens lay in 4 days? .....</p> |
|---|--|



- (52) At 1 kilometer equals .62 miles, how many kilometers are in 3.1 miles? ..... kilometer.
- (53) If  $1 \div \sqrt{20} = 1/20 \times a$ , then  $a^2 =$  .....
- (54) The sum of the coefficients of  $(a + b)^3$  is .....
- (55) The length of a chord 5' from center of a circle of radius 13' is .....
- (56) For what value of  $c$  does  $4x^2 - 12x + c = 0$  have equal roots?  $c =$  .....
- (57) If  $3x - 2y = 5$  and  $2x + 3y = 15$ , then  $x =$  .....
- (58) If  $3^{-x} = 1 \div 81$ , then  $x =$  .....
- (59) The slope of the line through (2,7) and (-3,4) is .....
- \*(60) The edge of a cube of diagonal 692.84 ft. is .....ft.
- (61) Write the Arabic numeral for MCMXCVI. ....
- (62) If  $2/9 = 5/x$ , then  $x =$  .....
- (63) How many subsets of 3 objects are contained in a set of 6 objects? .....
- (64) How many degrees are in each exterior angle of a regular decagon? .....°.
- (65) What is the smallest fraction greater than each of .112, .112112, 112112112, . . . . ? .....
- (66) The smallest integer which is a power of 3 and is greater than 700 is .....
- (67) The sum of the interior angles of a pentagon is .....°.
- (68) How many great great grand parents, counting those deceased, does one have? .....
- (69)  $(3^2)^3 =$  .....
- \*(70) At  $7\frac{1}{2}$  gal. per cubic ft. how many gallons are in a cube with edge of 15'? .....gal.
- (71) The angle between the line through (1,-3) and (2,0) and the one through (2,1) and (-1,2) contains how many degrees? .....°.
- (72) The distance from the point (1,2) to the point (4,6) is .....
- (73) Find  $y, y > 0$  so that the point (1,y) is on the circle  $(x - 1)^2 + (y + 3)^2 = 25$ .  $y =$  .....
- (74) The number of elements in the cartesian product of {1,0,2} and {0,1,2,3} is .....
- (75) The power set for (1,2,3,4,5) contains .....elements.
- (76) If  $\log_2 x + \log_2 4 = \log_2 8$ , then  $x =$  .....
- (77) The slope of the line  $x = 2y - 7$  is .....
- (78) The distance from the point (3,4) to the circle  $x^2 + y^2 = 4$  is .....
- (79) The distance between the centers of  $x^2 + y^2 = 1$  and  $(x - 3)^2 + (y - 4)^2 = 4$  is .....
- \*(80)  $1115 \times 1115 - 25 =$  .....

# The University of Texas Interscholastic League

## Number Sense Test, Series FF-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 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 answers 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

- |   |  |
|---|--|
| <p>(1) <math>9^3 =</math> .....</p> <p>(2) <math>33 + 27 - 96 =</math> .....</p> <p>(3) <math>87 - 129 =</math> .....</p> <p>(4) <math>7 \times 8 - 14 \times 4 =</math> .....</p> <p>(5) <math>19^2 =</math> .....</p> <p>(6) <math>47 + 48 + \dots + 53 =</math> .....</p> <p>(7) <math>115^2 =</math> .....</p> <p>(8) <math>84 \times 86 =</math> .....</p> <p>(9) <math>8^3 - 5^3 =</math> .....</p> <p>* (10) <math>28^3 + 48 =</math> .....</p> <p>(11) <math>1\frac{1}{6} \times \frac{2}{3} =</math> .....</p> <p>(12) <math>\frac{1}{6} \div 1\frac{1}{3} =</math> .....</p> <p>(13) <math>3\frac{1}{2} + 1\frac{2}{9} =</math> .....</p> <p>(14) <math>1\frac{5}{7} \times 35 =</math> .....</p> <p>(15) The least common denominator for <math>\frac{1}{8}, \frac{6}{56}, \frac{6}{14}</math> is .....</p> <p>(16) Reduce <math>\frac{42}{24}</math> to lowest terms. ....</p> <p>(17) <math>2\frac{1}{2} - 3\frac{2}{3} + \frac{1}{2} =</math> .....</p> <p>(18) <math>1\frac{1}{4} \times 3\frac{1}{4} \times \frac{1}{6} =</math> .....</p> <p>(19) Write the larger of <math>\frac{1}{15}, \frac{3}{46}, \frac{5}{14}</math> .....</p> <p>* (20) <math>21 \times 18700 =</math> .....</p> <p>(21) <math>6\frac{1}{4}\% =</math> ..... (fraction)</p> <p>(22) <math>\frac{17}{300} =</math> ..... %.</p> <p>(23) <math>44\frac{4}{9}\%</math> of 180 = .....</p> <p>(24) <math>64 \div 66\frac{2}{3}\% =</math> .....</p> <p>(25) 20 is what per cent of 32? ..... %.</p> <p>(26) <math>66\frac{2}{3}\%</math> of what number is 64? .....</p> <p>(27) 35% of 15% of 400 = .....</p> <p>(28) A \$99 suit, after a 11 <math>\frac{1}{9}\%</math> discount, sold for \$.....</p> <p>(29) \$20,000 less 5% less 20% of 5% of \$20,000 is \$.....</p> <p>* (30) 327% of \$180,000 = \$.....</p> <p>(31) Change 171, base 8, to base 10. ....</p> | <p>(32) 22 and 24 are each in base 5. Find their greatest common divisor in base 10. ....</p> <p>(33) 36 is in base 8. In base 10, how many positive integral divisors does it have? .....</p> <p>(34) What is the sum, in base 10 of the positive integral divisors of the number 36 of the last problem? .....</p> <p>(35) 87 and 78 are in base 9. Find the remainder in base 10 when their sum is divided by 8. ....</p> <p>(36) 26 and 34 are in base 7. In base 10, how many primes <math>p</math> satisfy: <math>26 \leq p \leq 34</math>? .....</p> <p>(37) What is the least common multiple in base 10 of the numbers 26, 34 of problem 36? .....</p> <p>(38) In base 10, how many integers between 1 and 13, base 9, are relatively prime to 13, base 9? .....</p> <p>(39) What is the remainder when <math>8^3</math> is divided by 7? .....</p> <p>* (40) <math>782 + 1782 + 5682 + 3434 =</math> .....</p> <p>(41) If a goblet has all its dimensions multiplied by <math>\frac{2}{3}</math>, the amount of liquid it will hold is multiplied by .....</p> <p>(42) If <math>x^2 - 2x + 3 = x^2 + 4</math>, then <math>x =</math> .....</p> <p>(43) If <math>x = 7</math>, then <math>x^2 + 5x + 9 =</math> .....</p> <p>(44) Find the area of a rhombus whose diagonals are 8 in. and 12 in. .... sq. in.</p> <p>(45) If <math>x = 7</math>, find the value of <math>(x - 1)(x^2 + x + 1)</math>. ....</p> <p>(46) If <math>x = 7</math>, find the value of <math>(x^4 + x^2 + 1) \div (x^2 + x + 1)</math>. ....</p> <p>(47) If <math>x^2 + y^2 + z(x^2 + y^2) = (u + z)(x^2 + y^2)</math>, then <math>u =</math> .....</p> <p>(48) Find the next term of 1, 3, 6, 11, 18, 19, ... ..</p> <p>(49) Find the area of a triangle with sides of 8 in., 15 in., and 17 in. .... sq. in.</p> <p>* (50) If <math>x = 180</math>, Find the value of <math>x^2 + 7x =</math> .....</p> |
|---|--|

- (51) Neglecting friction, a circular water pipe of diameter 4" will carry how many times as much water as one with 1" diameter?  
.....
- (52) It takes Tom 3 hr. to do a job which requires 7 hr. for Joe. At the same rates, how long will it take them together?.....hr.
- (53) Evaluate  $(8 \div 27)^n$ , with  $n = -\frac{2}{3}$ . .....
- (54) Find the third term of  $(3x + y)^8$ . ..... $xy^2$ .
- (55) If  $x^2 \geq 49$  and  $x < 0$ , what is the largest possible value of  $x$ ?  
.....
- (56) Find the sum of the roots of  $x^3 + 2x^2 + 5$ . .....
- (57) Find the product of the roots of  $x^3 + 2x^2 + 5$ . .....
- (58) Find the slope of the line perpendicular to the one through (5,7) and (2,9). .....
- (59) If a line with slope 3 contains points (3,1) and (x,4), then  $x =$   
.....
- \*(60) If  $A = 19$ , then  $A^3 + 20A^2 - 1 =$  .....
- (61) The Arabic numeral for CDXCVI is .....
- (62) If  $2 + x = k(3 + y)$  and  $x$  is 2 when  $y$  is 3, find  $x$  when  $y$  is 7.  
 $x =$  .....
- (63) If  $(x + 2) \div 3 = (x + 3) \div 2$ , then  $x =$  .....
- (64) How many straight lines are determined by 4 points, no three of which are in the same straight line? .....
- (65) How many planes are determined by 4 points, not all four in the same plane? .....
- (66) Write the smallest number greater than each of .212, .212212, .212212212 . . . .....
- (67) What is the probability that when three coins are tossed one will "land" heads and two will "land" tails? .....
- (68) For which value of  $a$  is the absolute value of  $a^2$  less than or equal to zero? .....
- (69) At 12.5 pesos to the dollar, 87.5 pesos = .....
- \*(70) If  $x = 27$ ,  $8x^3 + 36 =$  .....
- (71) The distance from  $(-1, -1)$  to  $(14, 19)$  is .....
- (72) The slope of the line through  $(-1, 1)$  and  $(14, 19)$  is .....
- (73) If  $\log_8 x = 2$ ,  $x =$  .....
- (74) Find the length of the tangent from  $(5,0)$  to the circle  $x^2 + y^2 = 9$ . .....
- (75) At  $7\frac{1}{2}$  gal. per cu. ft., how many gallons are in a  $1' \times 2' \times 3'$  bin? .....
- (76) The  $y$  value of the mid point of the line through  $(5,9)$  and  $(3,-5)$  is  $y =$  .....
- (77) The cartesian product of  $\{a,b,c\}$  and  $\{b,c,d\}$  contains .....
- ..... elements.
- (78) If  $(x,3)$  is on the circle  $x^2 - 2x + y^2 - 6y = 26$ , and  $x \neq 7$  then  $x =$  .....
- (79) The altitude on the 5" side of a  $3" \times 4" \times 5"$  right triangle is .....
- ..... in.
- \*(80)  $2^{12} + 4 =$  .....

# The University of Texas Interscholastic League

## Number Sense Test, Series FF-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 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 answers 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**

- |  |  |
|--|--|
| <p>(1) <math>3^6 =</math> .....</p> <p>(2) <math>87 - 23 - 56 =</math> .....</p> <p>(3) <math>127 - 146 =</math> .....</p> <p>(4) <math>49 \times 2 - 49 \times 9 =</math> .....</p> <p>(5) <math>(-18)^2 =</math> .....</p> <p>(6) <math>46 + 47 + \dots + 54 =</math> .....</p> <p>(7) <math>125^2 =</math> .....</p> <p>(8) <math>77 \times 83 =</math> .....</p> <p>(9) <math>9^8 - 6^8 =</math> .....</p> <p>* (10) <math>27^3 + 17 =</math> .....</p> <p>(11) <math>3\frac{1}{2} \times \frac{5}{7} =</math> .....</p> <p>(12) <math>5 \div 7\frac{1}{2} =</math> .....</p> <p>(13) <math>\frac{3}{7} \div 1\frac{1}{14} =</math> .....</p> <p>(14) <math>1\frac{3}{7} \times 91 =</math> .....</p> <p>(15) The least common denominator for <math>\frac{5}{6}, \frac{1}{10}, \frac{3}{22}</math> is .....</p> <p>(16) Reduce <math>\frac{28}{98}</math> to the lowest terms. ....</p> <p>(17) <math>1\frac{1}{5} + 2\frac{1}{10} - 3\frac{1}{4} =</math> .....</p> <p>(18) <math>12\frac{1}{2} \div (1\frac{1}{4} \times 3) =</math> .....</p> <p>(19) Write the larger of <math>\frac{5}{8}, \frac{14}{24}, \frac{20}{31}</math>. ....</p> <p>* (20) <math>19 \times 8700 =</math> .....</p> <p>(21) <math>44\frac{4}{9}\% =</math> ..... (fraction)</p> <p>(22) <math>\frac{14}{200} =</math> ..... %.</p> <p>(23) <math>18\frac{3}{4}\%</math> of 64 = .....</p> <p>(24) <math>35 \div 87\frac{1}{2}\% =</math> .....</p> <p>(25) 18 is what percent of 25? ..... %.</p> <p>(26) <math>87\frac{1}{2}\%</math> of what number is 63? .....</p> <p>(27) <math>66\frac{2}{3}\%</math> of <math>87\frac{1}{2}\%</math> of <math>\frac{24}{14} =</math> .....</p> <p>(28) <math>\frac{2}{11} \times \frac{3}{2} =</math> ..... %.</p> <p>(29) If, after a <math>16\frac{2}{3}\%</math> discount, a car sold for \$500, the original price was \$.....</p> | <p>* (30) 126% of \$18000 = \$.....</p> <p>(31) If a chicken keeps his same shape and wt. per cu. in. while growing to triple all his dimensions, his wt. is multiplied by .....</p> <p>(32) If <math>x^2 + 6x + 9 = 0</math>, then <math>x =</math> .....</p> <p>(33) The area of a square whose diagonal is <math>17\sqrt{2}</math> in, is.....sq. in.</p> <p>(34) If <math>x^2 + 1 = 0</math>, then <math>x^4 =</math> .....</p> <p>(35) The area of a rhombus with diagonals 6" and 8" is .....sq. in.</p> <p>(36) If <math>x = 5</math>, find <math>(x - 1)(x + 1)(x^2 + 1)</math>. ....</p> <p>(37) The next term of <math>\frac{1}{2}, \frac{2}{-1}, \frac{3}{-4}, \frac{4}{-7}, \frac{5}{-10}, \dots</math> is .....</p> <p>(38) The area of an isosceles triangle with sides of 5", 5", and 6" is ..... sq. in.</p> <p>(39) If <math>x = 5</math>, then <math>(x^4 - 1) \div (x^3 + x^2 + x + 1) =</math> .....</p> <p>* (40) <math>190 + 1966 + 5672 + 8932 =</math> .....</p> <p>(41) If one neglects friction, a pipe with rectangular 5" <math>\times</math> 6" cross section will carry how many times as much water per hour as one with rectangular 2" <math>\times</math> 3" cross section? .....</p> <p>(42) Tom does a job in 1 hr. which takes Joe 2 hr. to do. How long does it take them working together at the same rates?.....hr.</p> <p>(43) <math>(36)^{-3/2} =</math> .....</p> <p>(44) The coefficient of the xy term of <math>(x^4 + x^2y^2 + y^4) \div (x^2 + xy + y^2)</math> is .....</p> <p>(45) If <math>x^2 + 1 \geq 50</math> and <math>x &lt; 0</math>, what is the largest possible value of <math>x</math>? <math>x =</math> .....</p> <p>(46) The sum of the roots of <math>2x^2 - 5x + 7 = 0</math> is .....</p> <p>(47) The product of the roots of <math>2x^2 - 5x + 7 = 0</math> is .....</p> <p>(48) Find k so that the roots of <math>x^2 - 6x + 5k = 0</math> are equal. ....</p> <p>(49) The slope of the line through (-1,-2) and (-5,-6) is .....</p> |
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- \* (50) If  $x = 12$ , then  $(x - 1)(x + 1)(x^2 + 1) + 4 = \dots$
- (51) If  $x$  is the distance from  $(-1, -2)$  to  $(-5, -6)$  then  $x^2 = \dots$
- (52) Change 161, base 7, to base 10.  $\dots$
- (53) If 13 and 20 are each in base 9, their greatest common divisor in base 10 is  $\dots$
- (54) If 35 is in base 9, how many positive integral divisors does 35 have. Give answer in base 10.  $\dots$
- (55) Find, in base 10, the sum of the positive integral divisors of 35, in base 9.  $\dots$
- (56) If 76 and 62 are in base 8, find the remainder in base 10 when their product is divided by 7.  $\dots$
- (57) If 36 and 44 are each in base 8 their greatest common divisor in base 10 is  $\dots$
- (58) If 36 and 50 are each in base 8, the number of primes, in base 10, between 36 and 50 is  $\dots$
- (59) If 17 is in base 8, the number of positive integers, in base 10, between 1 and 17 which are relative prime to 17 is  $\dots$
- \* (60)  $(196)^{3/2} - 4 = \dots$
- (61) The Arabic numeral for MCDXLIV is  $\dots$
- (62) If  $11 + x = k^2(y^2 - 1)$  and  $x$  is 5 when  $y$  is 2, find  $x$  when  $y$  is 3.  $\dots$
- (63) If  $1/(x-2) = 1/(2x-1)$ , then  $x = \dots$
- (64) Tom and Charlie are members of a group of five from which a committee of two is randomly chosen. What is the probability that both are chosen?  $\dots$
- (65) Write the smallest number greater than each of .112, .112112, .112112112, . . .  $\dots$
- (66) The slope of the line  $2x - 5y = 7$  is  $\dots$
- (67) The line  $2x - 5y = 7$  crosses the  $x$  axis at  $x = \dots$
- (68) A race horse running at constant speed ran 44 ft. in one second. His rate was  $\dots$  M.P.H.
- (69) If  $\pi = 22/7$ , a circle of a diameter 14" has an area of  $\dots$  sq. in.
- \* (70) If  $x = 140$  and  $y = 120$ , then  $x^3 - y^3 = \dots$
- (71) If Mary is twice as old as she was 20 years ago, her age now is  $\dots$
- (72) Find  $\log_2 9 + \log_2 16/9$ .  $\dots$
- (73) If  $\log_3 x = 3$ , then  $x = \dots$
- (74) If chord of length 12" is 5" from the center of a circle of radius  $r$ , then  $r^2 = \dots$  sq. in.
- (75) At 231 cu. in. per gallon, how many gallons are in a rectangular box 231 in. by 5 in. by 6 in.?  $\dots$  gal.
- (76) The  $x$  value of the midpoint of a line through  $(2, -3)$  and  $(-3, 5)$  is  $x = \dots$
- (77) The power set of the cartesian product of  $\{a, b\}$  and  $\{a, b, c\}$  contains  $\dots$  elements.
- (78) If  $x^4 = x^2$  and  $x < 0$ , then  $x = \dots$
- (79) If a pyramid with base of 64 sq. in. has an altitude of 27 in., its volume is  $\dots$  cu. in.
- \* (80)  $3^{12} - 1 = \dots$

# 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 FF-1	Answer Key Number Sense Test FF-2	Answer Key Number Sense Test FF-3	Answer Key Number Sense Test FF-4	Answer Key Number Sense Test FF-5	Answer Key Number Sense Test FF-6
1. 248	1. 625	1. 512	1. 512	1. 729	1. 729
2. 42	2. 27	2. 114	2. 141	2. 36	2. 36
3. 191	3. 279	3. 261	3. 216	3. 42	3. 42
4. 288	4. 52	4. 153	4. 114	4. 0	4. 0
5. 286	5. 225	5. 441	5. 289	5. 861	5. 861
6. 78	6. 66	6. 98	6. 650	6. 80	6. 80
7. 4225	7. 4825	7. 9025	7. 7225	7. 18225	7. 18225
8. 3891	8. 4884	8. 8098	8. 6396	8. 7224	8. 7224
9. 385	9. 728	9. 1590	9. 296	9. 387	9. 387
10. 14,918-16,485	10. 13,205-14,695	10. 11,520-12,310	10. 10,165-11,235	10. 20,900-23,100	10. 20,900-23,100
11. 3/2	11. 7/5 or 1 2/5 or 1 4/5	11. 25/21 or 1 4/21	11. 5/6	11. 6/5 or 1 1/5 or 1 2/5	11. 6/5 or 1 1/5 or 1 2/5
12. 3/2 or 1 1/2 or 1 5/2	12. 7/5 or 1 2/5 or 1 4/5	12. 5/7 or 17/18	12. 1/10 or 1	12. 1/10 or 1	12. 1/10 or 1
13. 2 11/12 or 35/12	13. 4 7/12	13. 4 17/18	13. 5 9/14 or 79/14	13. 4 18/18	13. 4 18/18
14. 62	14. 77	14. 380	14. 67	14. 60	14. 60
15. 60	15. 84	15. 84	15. 140	15. 66	15. 66
16. 60	16. 14 8/8 or 2/3	16. 5/21	16. 140	16. 7/4 or 1 3/4	16. 7/4 or 1 3/4
17. 1	17. 3 1/12	17. 4 1/6	17. 2/8	17. 2/8	17. 2/8
18. 7/2 or 3 1/2 or 3 5/2	18. 2/21	18. 1	18. 7/2 or 3 1/2 or 3 5/2	18. 19/4 or 3 1/4 or 3 3/5	18. 19/4 or 3 1/4 or 3 3/5
19. 3,349,580-9,228,450	19. 1,571,100-1,278,900	19. 29/31	19. 118,560-181,040	19. 5/14	19. 5/14
20. 8,349,580-9,228,450	20. 1,571,100-1,278,900	20. 1,800,075-1,486,925	20. 118,560-181,040	20. 373,065-412,885	20. 373,065-412,885
21. 5/6	21. 6/8	21. 1/6	21. 1/8	21. 1/16	21. 1/16
22. 7 1/3%	22. 23/200	22. 17/300	22. 6 2/3%	22. 5 2/3%	22. 5 2/3%
23. 49	23. 20 2/3 or 62/3	23. 24	23. 24	23. 80	23. 80
24. 30%	24. 1 1/20	24. 160	24. 4 9/9%	24. 96	24. 96
25. 30%	25. 9%	25. 20%	25. 24	25. 63 1/2%	25. 63 1/2%
26. 27	26. 256	26. 280	26. 82	26. 96	26. 96
27. 32/3 or 10 2/3	27. 14	27. 14	27. 27	27. 21	27. 21
28. \$40	28. 40 cents	28. \$860.	28. 87.50	28. 888	28. 888
29. \$400	29. \$5775	29. 8/3 or 2 2/3	29. \$111	29. \$18,800	29. \$18,800
30. 10,374-11,466	30. 25885.5-28865.5	30. 8248-8591	30. 893.3-484.7	30. \$659,170-\$618,030	30. \$659,170-\$618,030
31. 41	31. 4 or four	31. 131	31. 4	31. 121	31. 121
32. 5	32. 2	32. 14	32. 5 yr.	32. 2	32. 2
33. 42	33. 5 yr.	33. 196	33. 1/8	33. 8	33. 8
34. 7	34. 60 sq. in.	34. 8	34. 24 in.	34. 72	34. 72
35. 6	35. 3800 lb.	35. 72	35. 8 1/5 or 16/5 or 3 2/5 ft.	35. 6	35. 6
36. 98	36. 4	36. 2	36. 0	36. 1 or one	36. 1 or one
37. 1	37. 8	37. 5	37. 1	37. 100	37. 100
38. 8	38. 4	38. 8	38. 1	38. 4	38. 4
39. 6	39. 63	39. 1	39. 137/60 or 2 17/60	39. 11	39. 11
40. 146,718-162,162	40. 15,390-17,010	40. 1,82,008-1,317,477	40. 41,563-45,927 cu. ft.	40. 11,096-12,264	40. 11,096-12,264
41. 8	41. 11,1001	41. 27	41. 19	41. 8/27	41. 8/27
42. 13	42. 19	42. 4	42. 114	42. 1/2	42. 1/2
43. 8 or eight	43. 228	43. 108.	43. 114	43. 98	43. 98
44. 27	44. 140	44. 0	44. 4	44. 48 sq. in.	44. 48 sq. in.
45. 9	45. 6	45. 0	45. 80	45. 842	45. 842
46. 6/5 days	46. 68	46. 0	46. 0	46. 48	46. 48
47. 88 in.	47. 18	47. 8	47. 2	47. 1	47. 1
48. 1	48. 1	48. 2	48. 6 or six	48. 82	48. 82
49. 3/4	49. 2 or two	49. 121	49. 1	49. 60 sq. in.	49. 60 sq. in.
50. 14,250-15,750 sq. in.	50. 632,015-638,544	50. 8075-8925	50. 47,481-52,479	50. 31,977-35,348	50. 31,977-35,348
51. 17	51. 100 eggs	51. 1 3/7 hr or 10 7/7 hr.	51. 27	51. 16	51. 16
52. 15/8 or 1 7/8 or 1.875	52. 180 m.p.h.	52. 808 ft. per sec.	52. 5 kilo.	52. 21/10 or 2 1/10 or 2.1 hr.	52. 21/10 or 2 1/10 or 2.1 hr.
53. 1	53. 8	53. 1/4	53. 20	53. 9/4 or 2 1/4 or 2.25	53. 9/4 or 2 1/4 or 2.25
54. 13	54. 10	54. 24 3/4	54. 8	54. 9xy <sup>2</sup>	54. 9xy <sup>2</sup>
55. 3	55. 7	55. 24 ft.	55. 24 ft.	55. 7	55. 7
56. 2 14/99	56. 1 or one	56. 9	56. 2	56. 2	56. 2
57. 5/3 or 1 2/3	57. 1	57. 4 1/7	57. 45/13 or 3 6/13	57. 5	57. 5
58. 8	58. 3/2 or 1 1/2	58. 3/3	58. 4/5 or 6/5	58. 8/2 or 1 1/2 or 1.5	58. 8/2 or 1 1/2 or 1.5
59. 16	59. 2/8	59. 2/3	59. 8/5 or 6/5	59. 4	59. 4
60. 3871.5-3726.5	60. 32,680-36,130	60. 128,380-136,920	60. 380-480 ft.	60. 18,376-14,784	60. 18,376-14,784
61. 24 m.p.h.	61. 17	61. 19	61. 1996	61. 496	61. 496
62. 4	62. 2/3	62. 12/5 or 2 2/5 or 2.4	62. 22 1/2 or 45/2 or 22.5	62. 4 2/8 or 14/8	62. 4 2/8 or 14/8
63. 386	63. 4	63. 6/3	63. 20	63. 5	63. 5
64. 4	64. 4 7/12 or 15/2	64. 2	64. 36	64. 6	64. 6
65. 8	65. 6	65. 2	65. 112/999	65. 4	65. 4
66. 1/4	66. 86	66. 4	66. 729	66. 212/999	66. 212/999
67. 3	67. 8	67. 1 1/4 or 45/4	67. 540	67. 8/8	67. 8/8
68. 3/2	68. 5	68. 1	68. 16	68. 0	68. 0
69. 5/2	69. 82	69. 3	69. 729	69. 7 dollars	69. 7 dollars
70. 72,960-80,640A	70. 16,150-17,850	70. 4560-5040	70. 24,048-26,578.2 gal.	70. 149,625-155,375	70. 149,625-155,375
71. 12 7/7 or 1 5/7	71. 1723	71. 458	71. 90	71. 25	71. 25
72. 10	72. 7 1/5 or 7 2/5	72. 19/999	72. 5	72. 6/5 or 1 1/5 or 1.2	72. 6/5 or 1 1/5 or 1.2
73. 34	73. 6	73. 13	73. 19/999	73. 2	73. 2
74. 34	74. 8	74. 11 1/4 or 45/4	74. 10 1/2	74. 4	74. 4
75. 1/13	75. 81/4 or 20 1/4 or 20.25	75. 10 1/2 F	75. 12	75. 4	75. 4
76. 1498	76. 100/99 or 1 1/99	76. 112	76. 2	76. 2	76. 2
77. 64 or sixty four du.	77. 81 1/4 or 31.25 pesos	77. 2	77. 1 1/2 or .5	77. 9	77. 9
78. 81 1/4 or 31.25 pesos	78. 60/13 or 4 8/13 in.	78. 72 sq. in.	78. 5	78. 5	78. 5
79. 60/13 or 4 8/13 in.	79. 3025	79. 8 8/7 or 45/7	79. 1,181,040-1,305,380	79. 12/5 or 2 2/5 or 2.4 in.	79. 12/5 or 2 2/5 or 2.4 in.
80. 19287.5-21262.5 sq. in.	80. 8585-9765	80. 18.56-17.21 c.c.	80. 1,181,040-1,305,380	80. 3895-4305	80. 3895-4305