



Educating the leaders of tomorrow

# Number Sense Practice Packet



Spring 2022 | High School

Six practice tests by Larry White



# NUMBER SENSE

## Practice Packet S22

Written by

**Larry White, Contest Director**

*We are a small company that listens! If you have any questions or if there is an area that you would like fully explored, let us hear from you. We hope you enjoy this product and stay in contact with us throughout your academic journey.*

~ President Hexco Inc., Linda Tarrant

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IF YOU LIKE THIS PRODUCT, WE ALSO RECOMMEND

**Mental Math Notes**

**Number Sense Practice Packets from previous years**

# UIL NUMBER SENSE PRACTICE PACKET – Spring 2022



## CONTENTS

### **Six Sets of Number Sense Tests (S22A-S22F)**

#### Each Test Includes:

- 80 Questions - fill-in-the-blank
- Solutions

For official UIL Constitution and Contest Rules for Number Sense, please review the Section 920 document at:  
<http://www.uiltexas.org/academics/number-sense>

# Hexco 2021-22 Number Sense Test S22A

Final	_____
2nd	_____
1st	_____
Score	_____
Initials	_____

Contestant's Number \_\_\_\_\_

**Read directions carefully  
before beginning test**

**DO NOT UNFOLD THIS SHEET  
UNTIL TOLD TO BEGIN**

**Directions:** Do not turn this page until the person conducting this test gives the signal to begin. This is a ten-minute test. There are 80 problems. Solve accurately and quickly as many as you can in the order in which they appear. ALL PROBLEMS ARE TO BE SOLVED MENTALLY. Make no calculations with paper and pencil. Write only the answer in the space provided at the end of each problem. Problems marked with a ( \* ) require approximate integral answers; any answer to a starred problem that is within five percent of the exact answer will be scored correct; all other problems require exact answers.

The person conducting this contest should explain these directions to the contestants.

**STOP -- WAIT FOR SIGNAL!**

- |   |   |
|---|---|
| <p>(1) <math>2122 + 2212 =</math> _____</p> <p>(2) <math>3.8 - 2\frac{1}{2} =</math> _____ (mixed number)</p> <p>(3) <math>1.8 \div 0.09 =</math> _____</p> <p>(4) <math>\frac{3}{8} \times \frac{5}{9} =</math> _____</p> <p>(5) <math>\frac{3}{16} =</math> _____ (decimal)</p> <p>(6) <math>21^2 =</math> _____</p> <p>(7) <math>1 \times 3 \div 6 + 10 - 15 =</math> _____</p> <p>(8) <math>48 \times 15 =</math> _____</p> <p>(9) <math>11 \times 64 - 11 \times 16 =</math> _____</p> <p>* (10) <math>257 + 1219 + 3150 =</math> _____</p> <p>(11) <math>44\frac{4}{9}\%</math> of 180 is _____</p> <p>(12) If 10 pens cost \$4.90, then 8 pens will cost \$ _____</p> <p>(13) The LCM of 48 and 80 is _____</p> <p>(14) The arithmetic mean of 31, 36, and 44 is _____</p> <p>(15) <math>\frac{8}{11} + 1\frac{3}{8} =</math> _____ (mixed number)</p> <p>(16) The number of prime numbers greater than 20 and less than 40 is _____</p> | <p>(17) <math>42 \times 38 =</math> _____</p> <p>(18) 2022 <math>\div</math> 6 has a remainder of _____</p> <p>(19) Which is greater, <math>\frac{7}{9}</math> or 0.79? _____</p> <p>* (20) <math>847 \times 2022 =</math> _____</p> <p>(21) <math>37 \times 77 =</math> _____</p> <p>(22) <math>32^2 + 17^2 =</math> _____</p> <p>(23) <math> 7 - 2  + 9 -  11 - 20  =</math> _____</p> <p>(24) <math>W = \{w,r,e,n\}</math>, <math>R = \{r,o,b,i,n\}</math>, and <math>F = \{f,i,n,c,h\}</math>.<br/>How many unique elements are in <math>W \cup R \cup F</math>? _____</p> <p>(25) <math>123_4 =</math> _____ <math>_{10}</math></p> <p>(26) Let <math>\frac{2}{3} = \frac{4}{x}</math>. Find <math>\frac{x}{5}</math>. _____</p> <p>(27) <math>(\sqrt{144})^3 =</math> _____</p> <p>(28) The additive inverse of <math>-\frac{2}{3}</math> is _____</p> <p>(29) If <math>8^{(x)} = 5\frac{6}{7}</math>, then <math>8^{(x-1)} =</math> _____</p> <p>* (30) <math>212732 \div 32 =</math> _____</p> <p>(31) <math>28 \times 88 =</math> _____</p> <p>(32) Let <math>\frac{14}{33} = 0.ababab\dots</math>. Find <math>a + b</math>. _____</p> |
|---|---|

- (34) An angle complementary to  $62^\circ$  measures \_\_\_\_\_ $^\circ$
- (35) Given: 1, 3, 6, 10, p, ..., 36, 45, r, ... .  $p + r =$  \_\_\_\_\_
- (36) The product of the coefficients of  $(x + 2y)^3$  is \_\_\_\_\_
- (37) If  $y = 5 - 2x$  and  $x = 3y - 1$ , then  $y =$  \_\_\_\_\_
- (38) If  $(2x - 3)(3x - 2) = ax^2 + bx + c$ , then  
 $a - b - c =$  \_\_\_\_\_
- (39) The area of a rectangle with length 8 cm is  $72 \text{ cm}^2$ .  
The perimeter of the rectangle is \_\_\_\_\_ cm
- \*(40)  $\sqrt{182321} =$  \_\_\_\_\_
- (41)  $49 + 49^2 =$  \_\_\_\_\_
- (42)  $83 \times 87 =$  \_\_\_\_\_
- (43) The larger root of  $(3x + 5)^2 = 49$  is \_\_\_\_\_
- (44)  $113^{13} \div 13$  has a remainder of \_\_\_\_\_
- (45) If  $45 \times 54 = 9k$ , then  $k =$  \_\_\_\_\_
- (46)  $64^2 - 65^2 + 66 =$  \_\_\_\_\_
- (47)  $15\frac{1}{7} \times 7\frac{1}{15} =$  \_\_\_\_\_ (mixed number)
- (48)  $997^2 =$  \_\_\_\_\_
- (49)  $86_9 \div 6_9 + 68_9 =$  \_\_\_\_\_<sub>9</sub>
- \*(50)  $4 \times 12 \times 20 \times 28 =$  \_\_\_\_\_
- (51) Given: 2, 2, 5, 10, 26, k, 170, ... . Find k. \_\_\_\_\_
- (52)  $\frac{2}{3} + \frac{3}{5} + 1\frac{4}{15} + 1\frac{13}{15} + 3\frac{2}{15} + \dots + 21\frac{4}{15} =$  \_\_\_\_\_
- (53) Find the sum of the reciprocals of the first twelve triangular numbers. \_\_\_\_\_
- (54)  $(6 - 5i)(7 + 4i) = (a + bi)$ .  $a + b =$  \_\_\_\_\_
- (55)  $202 \times 123 =$  \_\_\_\_\_
- (56) The measure of the central angle of a regular octagon is \_\_\_\_\_ degrees
- (57)  ${}_9C_6 =$  \_\_\_\_\_
- (58) The coefficient of the  $x^2y$  term when  $(2x + 5y)^3$  is expanded is \_\_\_\_\_
- (59) Let  $L = \{2, 1, 3, 4, 7, 11, 18, 29\}$ . The probability of drawing a composite number is \_\_\_\_\_%
- \*(60)  $8^3 \times 4^2 \div 32 =$  \_\_\_\_\_
- (61)  $\frac{8 \times 9! + 9 \times 8!}{8!} =$  \_\_\_\_\_
- (62) Find the sum of all positive integers  $x$  such that  $19 - 4x \geq 7$ . \_\_\_\_\_
- (63) How many positive integers less than or equal to 34 are relatively prime to 34? \_\_\_\_\_
- (64)  $\frac{4}{7} - \frac{23}{43} =$  \_\_\_\_\_
- (65)  $5032 \times 13 =$  \_\_\_\_\_
- (66) If  $222 \times \frac{k}{27} = 32\frac{8}{9}$ , then  $k =$  \_\_\_\_\_
- (67)  $(45_8 \times 72_8 + 61_8) \div 7_8$  has a remainder of \_\_\_\_\_
- (68)  $\sin^2\left(\frac{3\pi}{4}\right) =$  \_\_\_\_\_
- (69) The radius of the inscribed circle of a 7-24-25 right triangle is \_\_\_\_\_ units
- \*(70) 65 miles per hour = \_\_\_\_\_ feet per second
- (71)  $y = \log_5(3x + 2)$ . The domain of  $y$  is  $x >$  \_\_\_\_\_
- (72) The first four digits of the decimal for  $\frac{23}{70}$  base 8 is 0. \_\_\_\_\_ base 8
- (73)  $\int_{-1}^2 (3x^2 - 1) dx =$  \_\_\_\_\_
- (74) If  $f(x) = \frac{2x+3}{5} - 6$ , then  $f^{-1}(1) =$  \_\_\_\_\_
- (75) If  $f(x) = \frac{2x+3}{5} - 6$ , then  $f[f^{-1}(1)] =$  \_\_\_\_\_
- (76) Find the sum of the squares of the roots taken two at a time of  $x^3 - 5x^2 - 2x + 24 = 0$ . \_\_\_\_\_
- (77)  $345_9 =$  \_\_\_\_\_<sub>3</sub>
- (78) The graph of  $y = \log_3(x + 3)$  has a vertical asymptote of  $x =$  \_\_\_\_\_
- (79)  $\frac{7}{24} + \frac{7}{48} + \frac{7}{80} =$  \_\_\_\_\_
- \*(80)  $\sqrt{1234} \times \sqrt{5678} \times \sqrt{90} =$  \_\_\_\_\_