

The University Interscholastic League
Number Sense Test, Series WW-B

Contestant's Number _____

Contestant's Score _____

**Read Directions Carefully
 Before Beginning Test**

**Do Not Unfold This Sheet
 Until Told To Begin**

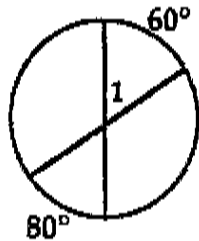
DIRECTIONS: Do not turn this page until the person conducting this test gives the signal to begin. This is a ten-minute test. There are 80 problems. Solve accurately and quickly as many as you can in the order in which they appear. **ALL PROBLEMS ARE TO BE SOLVED MENTALLY.** Make no calculations with paper and pencil. Write only the answer in the space provided at the end of each problem. Problems marked with a (*) require approximate integral 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.

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

Stop - Wait for Signal

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| <p>(1) $4.16 \times 100 - 21 =$ _____</p> <p>(2) $\frac{3}{4} \times \frac{8}{5} \times \frac{10}{27} =$ _____</p> <p>(3) $29 \times 11 =$ _____</p> <p>(4) $7(7) + 7(16) + 7(27) =$ _____</p> <p>(5) Reduce to lowest terms: $\frac{111}{123} =$ _____</p> <p>(6) $42^2 =$ _____</p> <p>(7) $168 \div 12 =$ _____</p> <p>(8) $13\frac{3}{4}\%$ = _____ (fraction).</p> <p>(9) LXX = _____ (Arabic Numeral).</p> <p>*(10) $599 \times 199 + 200 =$ _____</p> <p>(11) If 1 gram = .04 oz., 1600 grams = _____ lbs.</p> <p>(12) 30 is what percent of 120? _____ %.</p> <p>(13) $14 \times 4 + 16 \div 2 =$ _____</p> <p>(14) The negative reciprocal of $\frac{3}{4}$ is _____</p> <p>(15) $15 \times 12 + 30 \times 24 =$ _____</p> <p>(16) $64^2 - 56^2 =$ (8) _____</p> <p>(17) Which is smaller $\frac{5}{-6}$ or $\frac{-9}{10}$? _____</p> <p>(18) $(43 \times 27) \div 3$ has a remainder of _____</p> <p>(19) $\frac{9}{5^4(2)} =$ _____ (decimal).</p> | <p>*(20) $29 \times 30 \times 31 - 100 =$ _____</p> <p>(21) 25% of _____ is 15% of 60.</p> <p>(22) $\sqrt{19(76)} =$ _____</p> <p>(23) If $2^x - 2 = 14$, then $x =$ _____</p> <p>(24) How many positive integers divide 40? _____</p> <p>(25) The discriminant of $x^2 - 4x + 2 = 0$ is _____</p> <p>(26) $124_5 =$ _____ 10.</p> <p>(27) $f(x) = x^3 - 4x^2$, evaluate $f(5)$. _____</p> <p>(28) If $\frac{x}{4} = \frac{16}{x}$, $x < 0$, then $x =$ _____</p> <p>(29) $.3444\dots =$ _____ (fraction).</p> <p>*(30) $93015 \div 351 =$ _____</p> <p>(31) The sum of the positive integral divisors of 30 is _____</p> <p>(32) Change 25 base 8 to base 7. _____</p> <p>(33) $111 \times 57 =$ _____</p> <p>(34) If a 4 by 6 picture is enlarged to 12 by 18, its area is multiplied by _____</p> <p>(35) $42 \times 48 =$ _____</p> <p>(36) Find x, if $2x - y = 4$ and $x + 2y = 7$. _____</p> <p>(37) What is the perimeter of a square whose diagonal is 4? _____</p> |
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- (38) $(42_5)(2_5) =$ _____
- (39) $93 \times 106 =$ _____
- *(40) $29 \times 120 + 119 \times 119 =$ _____
- (41) The x-intercept of $3x - 3y = 9$ is _____
- (42) Two chords intersect in a circle as shown below. Find the measure of angle 1. Angle 1 = _____°.



- (43) Find x , if $4^{3x} = 256$. _____
- (44) The largest integer x , such that $2x - 1 < 7$ is _____
- (45) $997 \times 996 =$ _____
- (46) The next term in the sequence 2, 6, 18, ... is _____
- (47) $5^4 \div 12$ has a remainder of _____
- (48) Find x , $x > 0$, if $|3x - 1| = 4$. _____
- (49) The hypotenuse of a right triangle is 37 and one leg is 12. The other leg is _____
- *(50) $\sqrt{17161} =$ _____
- (51) The modulus of $2 + i$ is _____
- (52) $(2x + 1)^2 = ax^2 + bx + c$ and $a + b + c =$ _____
- (53) Find x , if $\log_{13} x = 2$. _____
- (54) $(2 + 3i)(4 + i) = a + bi$ and $b =$ _____
- (55) If x and y vary directly and $x = 4$ when $y = 12$, find x when $y = 4$. _____
- (56) $\sqrt{-4} \sqrt{-9} =$ _____
- (57) $\log_6 36 = \log_4$ _____
- (58) $(a - 4i)^2 = -7 + 24i$ and $a =$ _____
- (59) $1 + 2 + 2^2 + 2^3 =$ _____
- *(60) $9 \times 11 \times 13 \times 15 =$ _____
- (61) A tin can has a diameter of 6 and a height of 12. The volume is $k\pi$ and $k =$ _____
- (62) $16 + 4 + 1 + \dots =$ _____
- (63) $\cos 120^\circ =$ _____
- (64) Find x , if $\det \begin{vmatrix} 2 & 4 \\ x & 6 \end{vmatrix} = 4$. _____
- (65) The odds of winning are 3 to 8. What is the probability of winning? _____
- (66) $\sin 35^\circ = \cos A$ and A is in Q I. $A =$ _____°
- (67) $40^\circ \text{ C} =$ _____° F
- (68) The volume of a sphere with a radius of 3 is $k\pi$ and $k =$ _____
- (69) Suppose $\cos .6 = .8$. What is $\sec .6$? _____
- *(70) The perimeter of the ellipse $4x^2 + 9y^2 = 36$ is _____
- (71) If $A = [4 \ 6]$ and $B = \begin{bmatrix} 2 \\ 4 \end{bmatrix}$, then $AB =$ _____
- (72) Change .12, base 5, to a base 10 decimal. _____
- (73) $f(x) = 3x + 1$, find $f^{-1}(x)$ _____
- (74) $\lim_{x \rightarrow 3} 2x^2 + 1 =$ _____
- (75) $(112_5) + (2_5) =$ _____ 5
- (76) $f(x) = x^2 + 1$ and $g(x) = x - 1$. Find $g[f(4)]$. _____
- (77) $\lim_{x \rightarrow \infty} \frac{3x - 1}{x} =$ _____
- (78) $f(x) = 2x^2 - 4$. Find $f''(2)$. _____
- (79) $\int_{-1}^1 x^2 dx =$ _____
- *(80) $1350 \times 1950 =$ _____