

1.  $5002 - 2005 =$  \_\_\_\_\_ .
2.  $46 \times 25 =$  \_\_\_\_\_ .
3.  $506 \times 13 =$  \_\_\_\_\_ .
4.  $5 + 6 \times 7 - 8 =$  \_\_\_\_\_ .
5.  $617 \div 5 =$  \_\_\_\_\_ (mixed number).
6.  $.125 \times 640 =$  \_\_\_\_\_ .
7.  $27^2 =$  \_\_\_\_\_ .
8.  $88 - 51 - 13 =$  \_\_\_\_\_ .
9. CDXLVIII = \_\_\_\_\_ (Arabic numerals).
- (\*) 10.  $27 + 843 + 166 + 823 - 45 =$  \_\_\_\_\_ .
11.  $168 \div 12 =$  \_\_\_\_\_ .
12. 3.5 feet = \_\_\_\_\_ inches.
13. XVI + XXIV = \_\_\_\_\_ (Arabic numeral).
14. 3% of 4000 is \_\_\_\_\_ .
15. The number 14 has how many positive integral divisors? \_\_\_\_\_ .
16.  $461 \div 8$  has a remainder of \_\_\_\_\_ .
17.  $35 \times 429 =$  \_\_\_\_\_ .
18.  $6\frac{3}{4} \times 6\frac{1}{4} =$  \_\_\_\_\_ (mixed number).
19.  $2 + 4 + 6 + \dots + 100 =$  \_\_\_\_\_ .
- (\*) 20.  $416 \times 112 =$  \_\_\_\_\_ .
21.  $91 \times 98 =$  \_\_\_\_\_ .
22. If  $A = 6$ ,  $B = 2$ , and  $C = 4$ , then  $C^2 - 3AB =$  \_\_\_\_\_ .
23.  $24^2 + 8^2 =$  \_\_\_\_\_ .
24.  $82_9 =$  \_\_\_\_\_ <sub>10</sub>.
25.  $.7 - .07 - .007 =$  \_\_\_\_\_ (decimal).
26.  $\sqrt{(24)(54)} =$  \_\_\_\_\_ .
27. Solve for  $x$ :  $8x - 57 = 4x - 17$  \_\_\_\_\_ .
28.  $.16666\dots =$  \_\_\_\_\_ (fraction).
29.  $\frac{27}{(2^3)(5)} =$  \_\_\_\_\_ % (decimal).
- (\*) 30.  $37\frac{1}{2} \times 7201 - 526 =$  \_\_\_\_\_ .
31. The average of 13, 17, 21, and 33 is \_\_\_\_\_ .
32. How many positive numbers less than or equal to 15 are relatively prime to 15? \_\_\_\_\_ .
33.  $102 \times 103 =$  \_\_\_\_\_ .
34.  $7.2 \times 6.8 =$  \_\_\_\_\_ .
35. The product of 9 and  $x$  is equal to the sum of 9 and  $x$ . Find  $x$ . \_\_\_\_\_ .
36.  $121_4 =$  \_\_\_\_\_ <sub>2</sub>.
37. 32 ounces = \_\_\_\_\_ gallons.
38. The diagonal of a square is  $18\sqrt{2}$  inches. Find its area. \_\_\_\_\_ in<sup>2</sup>.
39.  $9\frac{1}{3} \times 6\frac{1}{3} =$  \_\_\_\_\_ (mixed number).
- (\*) 40.  $\sqrt{310139} =$  \_\_\_\_\_ .

## Dr Numsen–High School Number Sense

41.  $7^2 + 24^2 - 25^2 =$  \_\_\_\_\_ .
42.  $994 \times 998 =$  \_\_\_\_\_ .
43. If  $F(x) = x^2 - 18x + 82$ , find  $F(5)$ . \_\_\_\_\_ .
44.  $85 \times 125 =$  \_\_\_\_\_ .
45. A regular  $n$ -gon has exterior angles measuring  $40^\circ$ .  
Find  $n$ . \_\_\_\_\_ .
46.  $81 \times 21 =$  \_\_\_\_\_ .
47. The product of the LCM and GCD of 98 and 102 is \_\_\_\_\_ .
48.  $304^2 =$  \_\_\_\_\_ .
49. The discriminant of  $2x^2 - x + 3 = 0$  is \_\_\_\_\_ .
- (\*) 50.  $12^2 \times 13 \times 14 =$  \_\_\_\_\_ .
51.  $3600 \div 75 =$  \_\_\_\_\_ .
52. A fair coin is flipped 6 times. Find the probability of getting 5 heads and 1 tail. \_\_\_\_\_ .
53.  $\log 10 =$  \_\_\_\_\_ .
54.  $121 \times 84 =$  \_\_\_\_\_ .
55.  $(\log_4 5)(\log_5 .25) =$  \_\_\_\_\_ .
56.  $7 \text{ ft}^2 =$  \_\_\_\_\_  $\text{in}^2$ .
57.  $6\frac{1}{4}\%$  = \_\_\_\_\_ (fraction).
58.  $7 \times 143 \times 9 =$  \_\_\_\_\_ .
59. If  $9x - 30 \geq 24$ , then  $x \geq$  \_\_\_\_\_ .
- (\*) 60. The perimeter of the ellipse  $12x^2 + 1500y^2 = 18000$  is \_\_\_\_\_ .
61. If  $(3 + 8i)(5 - 7i) = a + bi$ , then  $a =$  \_\_\_\_\_ .
62.  $\det \begin{vmatrix} -8 & -4 \\ 3 & -2 \end{vmatrix} =$  \_\_\_\_\_ .
63.  $\cos 30^\circ - \sin 60^\circ =$  \_\_\_\_\_ .
64.  $\frac{5}{6} - \frac{6}{5} =$  \_\_\_\_\_ .
65.  $32_6 \div 2_6 =$  \_\_\_\_\_  $_6$ .
66. How many ways are there to arrange the letters M, U, S, I, C in a row? \_\_\_\_\_ .
67. Find the coefficient of the 3rd term of the binomial expansion of  $(2x - 7y)^4$ . \_\_\_\_\_ .
68.  $3! \times 2! \div 1! =$  \_\_\_\_\_ .
69. If  $\sin x = \frac{4}{5}$  and  $x$  is in QI, then  $\frac{1}{\sec x} =$  \_\_\_\_\_ .
- (\*) 70.  $(1^4 + 2^4 + 3^4 + 4^4 + 5^4 + 6^4)^{2/3} =$  \_\_\_\_\_ .
71.  $3 + 9 + 27 + 81 + \dots + 2187 =$  \_\_\_\_\_ .
72.  ${}_4P_2 =$  \_\_\_\_\_ .
73. The sixth triangular number is \_\_\_\_\_ .
74. If  $H(x) = \frac{1}{4}x - \frac{1}{5}$ , then  $H^{-1}(2) =$  \_\_\_\_\_ .
75. The horizontal asymptote of  $f(x) = \frac{3x - 4}{5 - 3x}$  is \_\_\_\_\_ .
76. The minimum value of  $y = 4x^2 - 9x + 5$  occurs at  $x =$  \_\_\_\_\_ .
77.  $\left(\frac{14}{11} + \frac{11}{14} - 2\right) \times 308 =$  \_\_\_\_\_ .
78. If  $f(x) = x^6 + 2005$ , then  $f''(2) =$  \_\_\_\_\_ .
79.  $\lim_{x \rightarrow 0} \frac{\sin x}{x} =$  \_\_\_\_\_ .
- (\*) 80.  $300000 \div 54 \div 65 =$  \_\_\_\_\_ .