

Section 5-7: Scientific Notation

Writing Numbers in Scientific Notation

1. 060720a, P.I. 7.N.5
According to the 2000 census, the population of New York State was approximately 18,900,000. How is this number expressed in scientific notation?
[A] 18.9×10^6 [B] 189×10^5
[C] 1890×10^4 [D] 1.89×10^7
2. 080715a, P.I. 7.N.5
The video of the movie *Star Wars* earned \$193,500,000 in rental fees during its first year. Expressed in scientific notation, the number of dollars earned is
[A] 1.935×10^8 [B] 193.5×10^6
[C] 1935×10^8 [D] 1.935×10^6
3. 010111a, P.I. 7.N.5
The distance from Earth to the Sun is approximately 93 million miles. A scientist would write that number as
[A] 93×10^7 [B] 9.3×10^6
[C] 93×10^{10} [D] 9.3×10^7
4. 010206a, P.I. 7.N.5
The approximate number of seconds in a year is 32,000,000. When this number is written in scientific notation, the numerical value of the exponent is
[A] 7 [B] -7 [C] 8 [D] 6
5. 080607a, P.I. 7.N.5
A micron is a unit used to measure specimens viewed with a microscope. One micron is equivalent to 0.00003937 inch. How is this number expressed in scientific notation?
[A] 3.937×10^5 [B] 3937×10^8
[C] 3937×10^{-8} [D] 3.937×10^{-5}
6. 080210a, P.I. 7.N.5
If 0.0347 is written by a scientist in the form 3.47×10^n , the value of n is
[A] -2 [B] -3 [C] 2 [D] 3
7. 060504a, P.I. 7.N.5
The mass of an orchid seed is approximately 0.0000035 gram. Written in scientific notation, that mass is equivalent to 3.5×10^n . What is the value of n ?
[A] -7 [B] -6 [C] -5 [D] -8
8. 010609a, P.I. 7.N.5
The size of a certain type of molecule is 0.00009078 inch. If this number is expressed as 9.078×10^n , what is the value of n ?
[A] -5 [B] 8 [C] 5 [D] -8
9. 089904a, P.I. 7.N.7
Which expression is equivalent to 6.02×10^{23} ?
[A] 602×10^{21} [B] 60.2×10^{21}
[C] 0.602×10^{21} [D] 6020×10^{21}
10. 080511a, P.I. 7.N.5
The expression 0.62×10^3 is equivalent to
[A] 6.2×10^4 [B] 0.062
[C] 6.2×10^2 [D] 62,000

Changing to Ordinary Decimal Notation

11. 080004a, P.I. 7.N.6
Expressed in decimal notation, 4.726×10^{-3} is
[A] 0.04726 [B] 4,726
[C] 472.6 [D] 0.004726
12. 060301a, P.I. 7.N.6
The number 8.375×10^{-3} is equivalent to
[A] 0.08375 [B] 0.0008375
[C] 8,375 [D] 0.008375
13. 080424a, P.I. 7.N.6
The number 1.56×10^{-2} is equivalent to
[A] 156 [B] 0.156
[C] 0.00156 [D] 0.0156
14. 060628a
What is the sum of 6×10^3 and 3×10^2 ?
[A] 9×10^6 [B] 6.3×10^3
[C] 18×10^5 [D] 9×10^5
15. 060207a, P.I. A.N.4
If 3.85×10^6 is divided by 385×10^4 , the result is
[A] 3.85×10^{10} [B] 0.01
[C] 3.85×10^4 [D] 1
16. 010319a, P.I. A.N.4
What is the value of $\frac{6.3 \times 10^8}{3 \times 10^4}$ in scientific notation?
[A] 2.1×10^4 [B] 2.1×10^{-2}
[C] 2.1×10^{-4} [D] 2.1×10^2
17. fall0725ia, P.I. A.N.4
What is the quotient of 8.05×10^6 and 3.5×10^2 ?
[A] 2.3×10^{12} [B] 2.3×10^3
[C] 2.3×10^4 [D] 2.3×10^8
18. 010018a, P.I. A.N.4
If the number of molecules in 1 mole of a substance is 6.02×10^{23} , then the number of molecules in 100 moles is
[A] 6.02×10^{25} [B] 6.02×10^{22}
[C] 6.02×10^{24} [D] 6.02×10^{21}
19. 060429a, P.I. A.N.4
If the mass of a proton is 1.67×10^{-24} gram, what is the mass of 1,000 protons?
[A] 1.67×10^{-27} [B] 1.67×10^{-23}
[C] 1.67×10^{-21} [D] 1.67×10^{-22}
20. 060029a, P.I. A.N.4
The distance from Earth to the imaginary planet Med is 1.7×10^7 miles. If a spaceship is capable of traveling 1,420 miles per hour, how many days will it take the spaceship to reach the planet Med? Round your answer to the nearest day.
21. 060308b, P.I. A.N.4
Two objects are 2.4×10^{20} centimeters apart. A message from one object travels to the other at a rate of 1.2×10^5 centimeters per second. How many seconds does it take the message to travel from one object to the other?
[A] 1.2×10^{15} [B] 2.0×10^{15}
[C] 2.88×10^{25} [D] 2.0×10^4

- [1] D
- [2] A
- [3] D
- [4] A
- [5] D
- [6] A
- [7] B
- [8] A
- [9] A
- [10] C
- [11] D
- [12] D
- [13] D
- [14] B
- [15] D
- [16] A
- [17] C
- [18] A
- [19] C

[3] 499 days and appropriate work is shown,

such as $\frac{17,000,000 \text{ miles}}{1420 \frac{\text{miles}}{\text{hour}} \times 24 \frac{\text{hours}}{\text{day}}}$.

[2] Appropriate work is shown, but one computational error is made or the student incorrectly calculates 1.7×10^7 by one decimal place.

or [2] Appropriate work is shown, but the answer is rounded incorrectly or is not rounded.

[1] $1.7 \times 10^7 = 17,000,000$ is shown.

or [1] $\frac{1.7 \times 10^7}{1420} = 11,971.831$ hours is shown.

or [1] 34,080 miles in 1 day is shown.

or [1] 499 but no work is shown.

[0] The student does not understand scientific notation.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[20] obviously incorrect procedure.

[21] B