

Scientific Notation

Numbers & Patterns · Grade 8

◆ Medium · 12 Questions

Solve each problem. Show your work in the space provided. Write your answer on the line.

1. Multiply: $(3.0 \times 10^4) \times (2.0 \times 10^3)$

Answer: _____

2. Divide: $(8.4 \times 10^6) \div (2.0 \times 10^2)$

Answer: _____

3. Add: $(2.5 \times 10^3) + (3.0 \times 10^3)$

Answer: _____

4. Add: $(4.0 \times 10^4) + (3.0 \times 10^3)$

Answer: _____

5. Subtract: $(7.5 \times 10^5) - (2.0 \times 10^5)$

Answer: _____

6. Multiply: $(4.5 \times 10^{-3}) \times (2.0 \times 10^6)$

Answer: _____

7. The mass of Earth is about 5.97×10^{24} kg. Write this in standard form (describe the number).

Answer: _____

8. A virus is 2.5×10^{-7} m wide. A bacterium is 2.5×10^{-6} m wide. How many times wider is the bacterium?

Answer: _____

9. Divide: $(9.0 \times 10^{-2}) \div (3.0 \times 10^4)$

Answer: _____

10. $(6.0 \times 10^3)^2 = ?$

Answer: _____

11. Order from least to greatest: 5.2×10^3 , 8.1×10^2 , 3.0×10^4 , 2.5×10^3

Answer: _____

12. Light travels 9.461×10^{12} km in one year (1 light-year). The nearest star is 4.2 light-years away. Find that distance in km.

Answer: _____

Answer Key

Scientific Notation — Medium

1. 6.0×10^7

Multiply coefficients: $3 \times 2 = 6$. Add exponents: $4 + 3 = 7$. Answer: 6.0×10^7 .

2. 4.2×10^4

Divide coefficients: $8.4 \div 2 = 4.2$. Subtract exponents: $6 - 2 = 4$.

3. 5.5×10^3

Same power: add coefficients. $2.5 + 3.0 = 5.5$. Answer: 5.5×10^3 .

4. 4.3×10^4

Rewrite: $40.0 \times 10^3 + 3.0 \times 10^3 = 43.0 \times 10^3 = 4.3 \times 10^4$.

5. 5.5×10^5

Same power: $7.5 - 2.0 = 5.5$. Answer: 5.5×10^5 .

6. 9.0×10^3

$4.5 \times 2 = 9$. $-3 + 6 = 3$. Answer: 9.0×10^3 .

7. **5,970,000,000,000,000,000,000 kg (a 24-zero number)**

Move decimal 24 places right. It's approximately 6 septillion kilograms.

8. **10 times wider**

$(2.5 \times 10^{-6}) \div (2.5 \times 10^{-7}) = 10^{-6} / 10^{-7} = 10^1 = 10$.

9. 3.0×10^{-6}

$9 \div 3 = 3$. $-2 - 4 = -6$. Answer: 3.0×10^{-6} .

10. 3.6×10^7

$6^2 = 36$. $(10^3)^2 = 10^6$. $36 \times 10^6 = 3.6 \times 10^7$.

- 11. 8.1×10^2 , 2.5×10^3 , 5.2×10^3 , 3.0×10^4**

Convert: 810; 2,500; 5,200; 30,000. Order: $810 < 2,500 < 5,200 < 30,000$.

- 12. $\approx 3.97 \times 10^{13}$ km**

$4.2 \times 9.461 \times 10^{12} = 39.736 \times 10^{12} \approx 3.97 \times 10^{13}$ km.
