**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_\_**

**SIG FIGS ROCK! (and so does SCIENTIFIC NOTATION)**

|  |  |  |
| --- | --- | --- |
| **Rules for counting significant figures** | **Example** | **# of sig figs** |
| Digits other than zero are ALWAYS significant. | 37.5 | 3 |
| All zeros between two sig figs are significant. | 4006 | 4 |
| Zeros at the end of a number WITHOUT a decimal point are NOT significant. | 307,500 | 4 |
| Zeros at the end of a number WITH a decimal point are significant. | 85.600 | 5 |
| Zeros used for spacing the decimal point are not significant. | 0.00970 | 3 |

**Rule for determining significant figures when adding or subtracting**

The result has the same number of DECIMAL PLACES as the least precise measurement used in the calculation.

Example: 4.77 + 1.0 + 234.0 + 12.0111 = 251.8 round the answer at the 0.1 place because all the added values go to the 0.1 place

**Rule for determining significant figures when multiplying or dividing**

The result has the same number of significant figures as the measurement with the FEWEST NUMBER of significant figures.

Example: 3.22 x 0.094 = 0.30 only 2 sig figs in the answer because 0.094 only has 2 sig figs

**Rules on Scientific Notation**

1. Any value less than one should have a negative exponent. (0.0395 = 3.95 x 10-2)
2. Any value of ten or more should have a positive exponent. (4402 = 4.402 x 103)
3. Values between 1 and 10 have an exponent of zero. (8.0 = 8.0 x 100)
4. When putting a number in scientific notation, use only the sig figs and put only one **non-zero** digit to the left of the decimal.

Practice Problems

1. Write the number of sig figs in each value below.

1. 4302 \_\_\_\_\_\_ 2. 1,030 \_\_\_\_\_\_ 3. 2,074,000 \_\_\_\_\_\_ 4. 0.00080 \_\_\_\_\_\_

5. 0.00001 \_\_\_\_\_\_ 6. 367.50 \_\_\_\_\_\_ 7. 0.00320 \_\_\_\_\_\_ 8. 601,500.00 \_\_\_\_\_\_

9. 1,570,050 \_\_\_\_\_\_ 10. 47,000 \_\_\_\_\_\_ 11. 0.1020 \_\_\_\_\_\_ 12. 2.0390 \_\_\_\_\_\_

1. Round the following numbers to four sig figs.

1. 7.98369 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2. 40,555 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. 32.348 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 4. 92,856 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. 0.83455 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 6. 113,697 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. 101.009 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 8. 5,695,239 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. 353.55 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 10. 0.056718 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Solve the following and write the answer with the correct number of sig figs in expanded form. **Then**, write the number using scientific notation.
2. 8.01 + 4.7 + 56 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. 567.18 – 40.9 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. 78.000 + 4.900 + 24.1 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. (7,020.1 – 3509) + 300.22 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. (34.788 – 20.9) + (9.11 + 13) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. 7.11 x 0.87 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
8. 12.0 x 0.0500 x 430 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
9. 95,050 x 0.409 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
10. 78.00 / 9.00 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
11. 110.0 / 55.0 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
12. (732.3 x 9,609.4) / 0.0020 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
13. (0.0040 x 1.090) / (3,090 x 99,200) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_
14. 45 / (909 x 10) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
15. (10.0 + 4.11 + 0.012) / 84.9 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
16. (9,125.8 – 6.61) / (4.80 x 104) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
17. (345 – 2.1) (3,001) (0.00465) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
18. Put the following numbers in scientific notation.

1. 2,345 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2. 33,800 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. 0.0000707 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 4. 0.004050 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. 65.40 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 6. 0.0970 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Put the following numbers into expanded notation.

1. 9.4 x 106 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2. 1.500 x 102 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. 435.4 x 10-5 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 4. 3.10 x 10-3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. 6.00 x 10-6 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 6. 5.881 x 105 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_