Chemistry 12 - Review of Significant Digits

The rules for zeros in significant digits are as follows:

a) *All zeros between non-zero digits are significant.*

b) *Zeros at the beginning of a number (eg. 0.0095) are NOT SIGNIFICANT* !
If the number 0.0095 was written in scientific notation, it would be: 9.5×10^{-3}. The exponent is not counted as significant so this number has 2 significant digits.

c) *Zeros on the right side of a number (at the end) are significant if the DECIMAL POINT is shown.*

eg) 50.00 has 4 significant digits
43.0 has 3 significant digits
20. has 2 significant digits
100. has 3 significant digits

d) *Zeros to the left of an UNDERSTOOD decimal point are NOT significant.*

eg) 300 has 1 significant digit
10 000 has 1 significant digit
12 320 has 4 significant digits
420 has 2 significant digits

1. Find the number of **significant digits** in each of the following measurements:

a) 3.4005 5
b) 2980 3
c) 3.20×10^{-2} 3
d) 0.000308 3
e) 23.000 5
f) 9.080×10^{-3} 4
g) 1.00 3
h) 0.0027890 5
i) 320 000 2
j) 9 1

2. In any calculation involving *multiplication or division*, the answer should be rounded off to Least # of sig digs

3. In any calculation involving *addition or subtraction*, the answer should be rounded off to Least # of dec. places

4. Determine the correct answers to the following and express them with the CORRECT number of **significant digits**.

a) 32.56 ÷ 2.3 Answer 14

b) 7.809 x 3.21 Answer 25.1

c) $9.0 \times 10^{32} \times 3.0000$ Answer 2.7×10^{33}

d) 0.0054 ÷ 0.12 Answer 0.045 or 4.5×10^{-2}

e) $(2.020 \times 10^{3}) \times (2.80000 \times 10^{-2})$ Answer 5.656×10^{1} 56.56

f) 2.345 + 2.1 (2.345, 2.1) Answer 4.4

g) 4.5 - 7.987 Answer −3.5

h) 2.5785 + 6.752 Answer 9.331

i) 2.3000 + 0.00695 Answer 2.3070

j) 320 + 1000 (1000, 320) Answer 1000 1.0×10^{3}

5. Round the following to 3 significant digits.

a) 0.009078 Answer 0.00908 9.08×10^{-3}

b) 3 555 800 Answer 3560 000 3.56×10^{6}

c) 3.463×10^{3} Answer 3.46×10^{3} 3460

d) 0.0023548 Answer 2.35×10^{-3} 0.00235

e) 1.005×10^{4} Answer 1.01×10^{4}

f) 3.9004 Answer 3.90