Key

# 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!*

*c)* If the number 0.0095 was written in scientific notation, it would be: $9.5 \times 10^{-3}$. The exponent is not counted as significant so this number has 2 significant digits.

*d)* *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

*e)* *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) $3.20 \times 10^{-2}$ ..... 3
d) 0.000308 ..... 3
e) 23.000 ..... 5
f) $9.080 \times 10^{-3}$ ..... 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 the least number of significant figures

3. In any calculation involving *addition or subtraction*, the answer should be rounded off to the least number of decimal places

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

a) $32.56 \div 2.3$ Answer 14

b) $7.809 \times 3.21$ Answer 25.1

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

d) $0.0054 \div 0.12$ Answer 0.045

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

f) $2.345 + 2.1$ 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) $320 + 1000$ Answer 1320

5. Round the following to 3 significant digits. Use Scientific notation if necessary.

a) 0.009078 Answer $9.08 \times 10^{-3}$

b) 3 555 800 Answer $3.56 \times 10^{6}$

c) $3.463 \times 10^{3}$ Answer $3.46 \times 10^{3}$

d) 0.0023548 Answer $2.35 \times 10^{-3}$

e) $1.005 \times 10^{4}$ Answer $1.01 \times 10^{4}$

f) 3.9004 Answer 3.90