

## RULES FOR SIGNIFICANT NUMBERS

1. **Any nonzero digit is significant.** ...8.45 cm has three significant figures; 1.234 m has four significant figures.
2. **Zeros between nonzero digits are significant.** ...606 meters has three significant figures while 40,501 has five significant figures...
3. **Zeros to the left of the first nonzero digit are NOT significant.** Their purpose is to indicate the placement of a decimal point. ...0.08 liters has only one significant figure, while 0.0000349 has three significant figures...
4. **If a number is greater than one,** then all zeros written to the right of the decimal point are significant. Thus 2.0 has two significant figures, 2.00 would have three significant figures. ...40.062 has five significant figures and 3.040 has four significant figures...
5. **Trailing zeros in a number containing a decimal point are significant.** For example 0.090 kg has two significant figures, 0.3005 liter has four significant figures, and 0.00420 has three significant figures.
6. **For numbers that do not contain any decimal points,** the trailing zeros which are the zeros after the last nonzero digit may or may not be significant. Thus 400 cm may have one significant figure (4), two significant figures (40), or 3 significant figures (400). We cannot know which is correct without more information. In this particular case we can express the number 400 as  $4 \times 10^2$  for one significant figure,  $4.0 \times 10^2$  for two significant figures or  $4.00 \times 10^2$  for three significant figures.
7. **Assume that a single whole number digit** has as many significant figures to the right of the decimal as desired, unless otherwise stated.
8. **When numbers are multiplied or divided** to get the calculated quantity, the result may have no more significant figures than the measurement with the fewest significant numbers.
9. **When numbers are added or subtracted** to give a calculated quantity, it may have no column which represents a smaller quantity than the smallest numerical column common to both measurements. Thus the sum of 1.12 cm plus 21 cm is 22 cm, where the unit position represents the smallest numerical column common to both measurements. The addition or subtraction of numbers may have no decimal places greater than the measurement with the least number of decimal places.
10. **If a calculation has multiple steps, retain additional nonsignificant figures until the answer is achieved.** This helps to avoid any rounding errors (*California Institute of Technology*). The final answer must then be brought back into sync with the significant numbers of the original datum.

## BASIC TRIGONOMETRIC FUNCTIONS—SOH, CAH, TOA

1. Sine function = SOH = Sine = Opposite Hypotenuse
2. Cosine function = CAH = Cosine = Adjacent Hypotenuse
3. Tangent function = TOA = Tangent = Opposite Adjacent

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