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11. Summary

Definition of significant figures

The number of *significant figures* is the count of those digits that carry meaning with regards to precision.

Examples

- All non-zero digits are significant – 1235 has 4 significant digits.
- Zeros appearing between nonzero digits are significant – 101 has 3 significant digits.
- Trailing zeros in a number containing a decimal are significant – 32.000 has 5 significant figures.

Non-examples

- Trailing zeros in a number with no decimal are *not* significant – 5400 has 2 significant figures.
- Leading zeros in a decimal number are not significant – 0.0003 has 1 significant figure.

- Extraneous digits introduced in a computation to greater precision than measured data are *not* significant – if .25 and .50 are measurements accurate to $\pm$ .01, then in the product (.25)(.50) = 0.125 the last 5 is *not* significant.

Derivative of sine and cosine

The derivative of of the trig functions are:

$$\frac{d}{dx}\sin(x) = \cos(x) \tag{3.6}$$

$$\frac{d}{dx}\cos(x) = -\sin(x) \tag{3.7}$$

$$\frac{d^2}{dx^2}\sin(x) = -\sin(x) \tag{3.8}$$

$$\frac{d^2}{dx^2}\cos(x) = -\cos(x) \tag{3.9}$$

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Zeros in significant figures

I do not understand why "Trailing zeros in a number with no decimal are not significant – 5400 ha... 9