

# Summary: Trigonometric functions

## 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  $\pm 0.01$ , then in the product  $(.25)(.50) = 0.125$  the last 5 is *not* significant.

## Derivative of sine and cosine

The derivative of the trig functions are:

$$\frac{d}{dx} \sin(x) = \cos(x) \quad (1)$$

$$\frac{d}{dx} \cos(x) = -\sin(x) \quad (2)$$

$$\frac{d^2}{dx^2} \sin(x) = -\sin(x) \quad (3)$$

$$\frac{d^2}{dx^2} \cos(x) = -\cos(x) \quad (4)$$