

## How do you find $\log_2 7$ on your calculator ?

Most calculators only have 2 buttons for finding logarithms:  $\boxed{\log}$  and  $\boxed{\ln}$ .

$\log x$  means  $\log_{10} x$ , and  $\ln x$  means  $\log_e x$ .

( $e$  is a special number, approximately equal to 2.71828.

You will learn the full significance of  $e$  in precalculus and calculus.)

To find a logarithm using any base other than 10 or  $e$ ,  
you need the change of base formula.

$$\log_b x = \frac{\log x}{\log b} = \frac{\ln x}{\ln b}$$

For example,

$$\log_2 7 = \frac{\log 7}{\log 2} = \frac{\ln 7}{\ln 2}$$

**NOTE: The base (2) is in the logarithm in the bottom of the fraction.**

If your scientific calculator has a two line display, you can type in

$$\boxed{\log} \boxed{(} \boxed{7} \boxed{)} \boxed{\div} \boxed{\log} \boxed{(} \boxed{2} \boxed{)} \boxed{=}$$
 or  $\boxed{\ln} \boxed{(} \boxed{7} \boxed{)} \boxed{\div} \boxed{\ln} \boxed{(} \boxed{2} \boxed{)} \boxed{=}$

If your scientific calculator has only a one line display, you can type in

$$\boxed{7} \boxed{\log} \boxed{\div} \boxed{2} \boxed{\log} \boxed{=}$$
 or  $\boxed{7} \boxed{\ln} \boxed{\div} \boxed{2} \boxed{\ln} \boxed{=}$

You should get an answer around 2.807354922.

You can check the answer by finding  $2^{2.807354922}$ . You should get 7.

### NOTE:

**When working with logarithms, you should keep at least 4 decimal places for accuracy.**

**If you said the answer was 2.8, when you checked  $2^{2.8}$ , you would only get 6.9644 instead of 7.**

**Logarithms are often used in questions involving \$\$money\$\$.**

**If you wouldn't want your paycheck rounded down a lot, don't round down your logarithms a lot (unless you're working on Enable, in which case, read the instructions carefully on how many decimal places are wanted).**

Practice on your calculator and make sure you can get the following answers:

$$\log_5 125 = 3$$

$$\log_3 15 = 2.4649735...$$

$$\log_{11} 4 = 0.57812965...$$