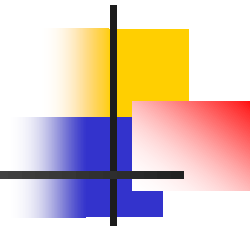# Warm-Up

1) Use $\log_3 5 = 1.465$ and $\log_3 6 = 1.631$ to approximate $\log_3 25$

2) Condense $7 \log_4 2 + 5 \log_4 x + 3 \log_4 y$

Natural Logarithms

e is a number $e \approx 2.71828$

The Natural Base e

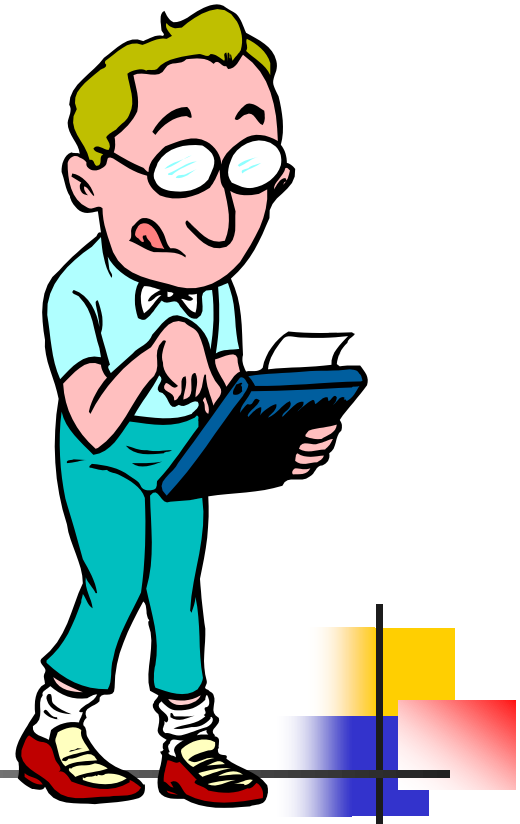Use a calculator to evaluate each expression
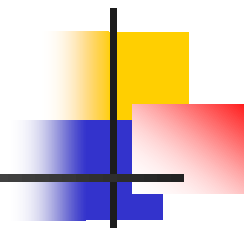
1) e^{-2} = 0.1353

2) e^{-1} = 0.3679

3) e^{1} = 2.7183

4) e^{2} = 7.3891

Remember the **Common Logarithm** has a base of …

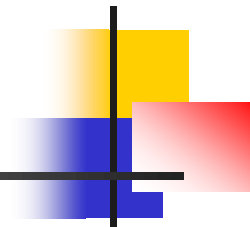$\log x =$ common

$\log_{10} x$ logarithm

The Natural Logarithm

$f(x) = \ln x$ is the <u>natural logarithm</u> function

It is the logarithmic function with **base e**.

$$\ln x = \log_e x$$

The Natural Logarithm

Common Log = Log_{10}

Natural Log = Log_e

Instead of writing $\text{Log}_e x$ every time, we just use $\ln x$.

e is a number $e \approx 2.71828$

Examples.

Evaluate with a calculator.

5) ln 2 = 0.6931

Remember, this means $e^? = 2$

6) ln 7 = 1.9459

Remember, this means $e^? = 7$

7) ln e^2 = 2

Remember, this means $e^? = e^2$