

**ENGR 1112**  
**Intro to Engr.**  
**Fall 2007**  
**HW#3**

**Due Date:** Tuesday Sept. 11, 2007 at class-time

**Helpful Notes**

- Engineering Accuracy is 0.2%.
- To find the percent change from a particular value, x, to another value, y, use the following

$$\frac{y-x}{x} 100 \%$$

- Be able to do the following on your calculator:
  - Change from radians to degrees (or the inverse).
  - Change from normal to scientific to engineering notation.
  - Enter a value in “exponential” notation.
  - Use parentheses properly.
  - Use trigonometry functions (including arc/inverse and hyperbolic)
  - Use logarithmic (common and natural) and exponential functions. Note on many calculators  $e^x$  will be shown – this is the same as  $\exp(x)$ .
- Shorthand Notation
  - *log* means common logarithm
  - *ln* mean natural logarithm

**Problem 1**

State the results of the following calculations with proper engineering accuracy.

<b>Calculation</b>	<b>Result</b>
14 ÷ 9	
23 x 5	
23 x 4	
-10 x 20	
(1.003 – 1.002)/1.003	

**Problem 2**

Using your calculator find each of the following and express each to the proper number of significant figures.

<b>Calculation</b>	<b>Result</b>
tan(12°)	
csc(1.22)	
*sin(100 grads)	
sec(3.14159)	
sec(3.14159/2)	

\*Look up what *grads* are.

**Problem 3**

Using your calculator find each of the following.

<b>Calculation</b>	<b>Result</b>
$\arctan(1)$	<i>in degrees</i>
$\tanh(1)$	
$\log(15 \times 20)$	
$\log(15) + \log(20)$	
$\ln(3.2^{5.17})$	
$\exp(\log(0.321))$	
$\sqrt[3]{\frac{2.51^{2.5} + 1.3215}{\frac{1.3^{0.8}}{2.51} + 1.322}}$	
$10^{4.532/5.422}$	
$\log_5(15)$	

**Problem 4**

Find the low and high of the range of possible values that each value may have given the specified accuracy.

<b>Value</b>	<b>% accuracy</b>	<b>low value</b>	<b>high value</b>
23.2 cm	1		
45 minutes	5		
107 g	0.5		