III. Laboratory Exercises:

1. Suppose that x=2 and y=5. Define these variables in MATLAB and construct a program to compute the following expressions:

a. $\frac{yx^3}{x-y}$

b. $\frac{3}{2}xy^2$

2. Define x and y as vectors x = 2,4,6,8,10 and y = 3,6,9,12,15 (Use shortcuts if applicable). Then use them in the following expression to solve for z.

$$\frac{xy + \frac{y}{x}}{x + y} + 12^{x/y}$$

3. Define the variables a, b, c, and d as: a=15.62, b=-7.08, c=6.25 and d=0.5(ab – c). Evaluate:

$$y = a + \frac{ab}{c}\frac{(a+b)^2}{\sqrt{|ab|}}$$

4. By defining first the variable x, construct the MATLAB program to evaluate the following equations:

a. $y = 2\frac{sin2x}{5}$, $x = \pi$

b. $y = 7\left(\frac{1}{x^3}\right) + 4x^{0.58}$, $x = 20$

5. Write MATLAB commands to solve the following equations.

a. $x = 4\cos 30° + \sqrt{10}\sin^2 30°$

b. $y = \ln 10 + \sqrt{30}\sin 25°$

6. Two vectors are given $\hat{a} = 6\hat{\imath} + 8\hat{\jmath} - 5\hat{k}$ and $\hat{b} = \hat{\imath} - 2\hat{\jmath} + 4\hat{k}$. Calculate their dot product and cross product.

7. Using the *linspace* function, create the following row vectors:

a. 2 4 6 8 10 12 14 16 18 20

b. –3.0000 –0.4444 2.1111 4.6667 7.2222 9.7778 12.3333 14.8889 17.4444 20.0000

8. If the volume of a cylinder of height h and radius r is $V = \pi r^2 h$, use MATLAB to find the volume enclosed by a cylinder that is 2 m in high with a diameter of 25 cm.