

## Summer 2014 MATLAB Assignment 2

Work the following problems (NOTE: these are RELATED TO the corresponding page and problem number from Gilat. Do NOT work the actual problems from the Lab Manual, or you will receive NO CREDIT!)

1. **g091x22** (element-by-element operations: see pp72-74):

Show that  $\lim_{x \rightarrow 0} \frac{e^x - 1}{x} = 1$ . Do this by creating a vector  $x$  that has elements: 1, 0.5, 0.1, 0.01, 0.001, 0.00001, and 0.0000001. Then, create a new vector  $y = \frac{e^x - 1}{x}$  (remember to use element-by-element operations). Use format long to display the elements of  $y$ .

2. **g163x02** (plotting functions: see pp139-140):

Plot the function  $f(x) = \frac{40}{1 + (x - 4)^2} + 5 \sin\left(\frac{20x}{\pi}\right)$  in the domain  $0 \leq x \leq 10$ .

3. **g164x06** (plotting functions: see pp139-140):

The position of a squirrel on a grass field over time is given by  $x(t) = -0.28t^2 + 6.5t + 61$ ,  $y(t) = 0.18t^2 - 8.5t + 65$ , with  $x$  and  $y$  in meters and  $t$  in seconds. Plot the position of the squirrel for  $0 \leq t \leq 30$  seconds.

4. **g093x32**: (Application of solving equations with matrices: review pp71-72 and plotting functions and points: see pp148-149):

The graph of a function  $p(x) = ax^4 + bx^3 + cx^2 + dx + e$  passes through the points  $(-4, -7.6)$ ,  $(-2, -17.2)$ ,  $(0.2, 9.2)$ ,  $(1, -1.6)$ , and  $(4, -36.4)$ . Determine the constants  $a$ ,  $b$ ,  $c$ ,  $d$ , and  $e$ , then plot the function and the points.

(HINT: your first equation is  $p(-4) = -7.6$  and so on. Ignore the text and legend commands in the plot example on p148)