**Midterm exam (Version A)**

1. **(10%)** Suppose that *x* = -2, *y* = 5, and *z* = 3. Use MATLAB to compute the following:

**(a)** **(b)** **(c)** exp(ln(4)) **(d)**

**(e)**

1. **(10%)** Let two complex numbers x = -7 - 5i and *y* = 4 - 3i. Use MATLAB to compute the following:
2. The magnitude and angle of *xy*. **(b)** The magnitude and angle of .
3. **(10%)** Create a vector *x* from -9 to 12 with an increment of 3 and a vector .
4. Find the array multiplication of *x* and *y*.
5. Find the remainder of *x* divided by 2.
6. **(10%)** Let a matrix B = [ 1.5, 1, 3; 6.5, -1.2, 12.4; 2.5, -1, 3.8; 2.4, 8.1, 5.8]. Use MATLAB to compute the following:
7. the maximum matrix element value in each row and column of matrix B,
8. the minimum matrix element value of matrix B.
9. **(10%)** Leibnez’s series is given by

Write a MATLAB script file to compute Leibnez’s series summation for 1000 terms by two methods: **(a)** a for-loop construct, **(b)** array operations. **(c)** Use tic and toc to determine the time needed to compute each implementation.

1. **(10%)** Evaluate the function

for x=1 to x=3 in steps of 0.01. Use the command plot(x,y) to show the function.

1. **(10%)** The following code is supposed to evaluate the function

Code:

x = lnspace(-4,4);

N = length x

for j = 1;N

if x(j) >=0 and x(i)<=1

f(j) =x(j);

elseif x(j)>1 or x(i)<2

f(j) = 2 – x;

else

f(j) = zero;

end

Correct the code so that it accomplishes this. Use the command plot(x,f) to show this function.

1. **(10%)** Suppose that a savings bank offers a tiered rate of interest that increases with the account balance as follows:

Suppose that a customer deposits 6000 for 20 years. Write a MATLAB script to compute the compound balance for years 1 through 20. Display the number of the years, the interest rate, the amount of interest, and the new balance.

1. **(10%)** There are 30.48 cm in a foot. Write a script to input a length in feet (which may have a decimal part) and convert it to kilometers(km), meters(m), and centimeters(cm). (Check: 3800.5 feet converts to 1 km 158m 39.24cm.)
2. **(10%)** Use the function quadratic(a,b,c) listed in our textbook to find the roots for the following cases: **(a)** quadratic(3,3,3), **(b)** quadratic(2,8,8), **(c)** quadratic(9,6,-3).