//AUTHOR: DAN CRISP

//CHAPTER 1 & 2 (cont.)

#Q1

Create a vector x with...

a: creating a vector with n elements, that increase by factors of 3 starting at 3.

n = 4;

for i=1:n x(i)=i\*3; end

b: creating a vector with n elements, which decreases by factors of 2 starting at 14.

n = 10;

for i=1:n x(i)=16-i\*2; end

c: creating a vector with n elements, which equal 1/i, starting from i=-3 and increasing by increments of 1.

n=7;

for i=1:n

if (i<3)

x(i)=1/(i-4);

else

x(i)=1/(i-2);

end

end

d: creating a vector with n elements, each equal to (-1+i)/i, starting from i=1 and with i increasing by increments of 1.

n=5;

for i=1:n

x(i)=(-1+i)/i;

end

#Q2

Let x = [3 2 6 8]' and y = [4 1 3 5]'

a: Add the sum of the elements in x to y

sum = z + y;

b: Raise each element of x to the power specified by the corresponding element in y.

xToPowy = x.^y;

c: Divide each element of y by the corresponding element in x

yByx = y./x;

d: Multiply each element in x by the corresponding element in y, calling the result "z"

z = x.\*y;

e: Add up the elements in z and assign the result to a variable called "w".

w = 0; for i=1:4 w=w+z(i); end

f: Compute x'\*y - w and interpret the result.

x'\*y - w is equal to 72 – 72, or zero. Meaning that the cross product between x and y is equal to the sum of term-by-term multiplication.

#Q3

Given a vector, t, of length n, write down the MATLAB expressions that will correctly compute the following.

a: ln (2+t^2)

log(2+t.^2)

b: (e^2)\*(1+cos(3\*t))

exp(2)\*(1+cos(3\*t))

c: (cos(t)^2) + (sin(t)^2)

(cos(t).^2) + (sin(t).^2)

d: archtan(t)

atan(t)

e: cot(t)

cot(t)

#Q4

1: Enter a list of names, age, sort them according to their last name.

names = {'abid', 'mansoor', 27; 'mark', 'konstantine', 25; 'anthony', 'martino', 26};

[b,index]=sort(names(1:3,2)); names(index(:),:)

'mark' 'konstantine' [25]

'abid' 'mansoor' [27]

'anthony' 'martino' [26]

2: Enter 20 numbers that are spaced equally with 6

nums = 6:6:120;

a 1x20 array populated with numbers each 6 numbers greater than the last.

3: Enter arrays of 10 names of students, their ID number, grades. Display the results with the average grade as table.

names = { 'Dan C', 'Abid', 'Mark', 'Anthony', 'Joe', 'Dave', 'Phil', 'Tyler', 'Dave', 'Tom' };

IDs = [14741,14742,12978,98032,40938,50378,97381,10478,20542,51842];

grade = [4.0, 1.0, 2.0, 3.5, 3.24, 3.7, 2.89, 2.99, 3.9, 2.75];

names(11) = 'AVERAGE'; IDs(11) = 0; grade(11) = sum(grade())/length(grade);

table(names,IDs,grade)

names IDs grade

\_\_\_\_\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_

'Dan C' 14741 4

'Abid' 14742 1

'Mark' 12978 2

'Anthony' 98032 3.5

'Joe' 40938 3.24

'Dave' 50378 3.7

'Phil' 97381 2.89

'Tyler' 10478 2.99

'Dave' 20542 3.9

'Tom' 51842 2.75

'AVERAGE' 0 2.997

4: Find the angle between the two vectors a=6i-2j-3k and b=i+j+k

a = [6,-2,-3]; b = [1,1,1];

acos((a.\*b)/(sqrt(a.^2).\*sqrt(b.^2)))

ans =

1.0822