WILL TIRONE

MAT 275

LAB 2

Question 1

```
A = [1 2 -1; 6 -8 -7; 2 -1 9];
B = [-1 18 3; 4 0 1; 17 12 20];
b = [-17;13;-8];
c = [5 -2 1];
d = [3;4;1];
```

a)

```
A*B
```

```
ans = 3×3
   -10     6   -15
  -157    24  -130
   147   144   185
```

```
B*A
```

```
ans = 3×3
   113  -149   -98
     6     7     5
   129   -82    79
```

```
c*A
```

```
ans = 1×3
    -5    25    18
```

```
B*d
```

```
ans = 3×1
    72
    13
   119
```

b)

```
C = [A;B]
```

```
C = 6×3
     1     2    -1
     6    -8    -7
     2    -1     9
    -1    18     3
     4     0     1
    17    12    20
```

```
D = [B d]
```

```
D = 3×4
    -1    18     3     3
```

```
     4     0     1     4
    17    12    20     1
```

c)

```
x = A\b
```

```
x = 3×1
   -5.7689
   -5.7378
   -0.2444
```

d)

```
A(2,3) = 0
```

```
A = 3×3
     1     2    -1
     6    -8     0
     2    -1     9
```

e)

```
a = A(2,:)
```

```
a = 1×3
     6    -8     0
```

f)

```
B(:,3) = []
```

```
B = 3×2
    -1    18
     4     0
    17    12
```

Question 2

a)

```
type("geosum1.m")
```

```
function geosum1(r,a,n)

S = 0;
for i = 0:n-1
   S =  S + (a * (r ^ i));
end
S
```

```
geosum1((8/9),7,7)
```

```
S = 35.3769
```

b)

```
type geosum2.m
```

```
function geosum2(r,a,n)

e = [0:n-1];
R = a.*(r.^e);
sum(R)
end
```

```
geosum2((8/9),7,7)
```

```
ans = 35.3769
```

Question 3

a)

```
type Exercise3.m
```

```
j=0;
a=1;
for i=1:2:20
    a = a * i;
end
a
```

```
Exercise3
```

```
a = 654729075
```

b)

```
j = (1:2:20);
prod(j)
```

```
ans = 654729075
```

Question 4

```
type("Exercise4.m")
```

```
y = zeros(1,1000);
k = 1;
value = 1;

tic
while value < 10^4

    % per MATLAB tool tip, initializing an array of zeros and replacing
    % them with values is more efficient than concatenating arrays
    % repeatedly so I did that then resized at the end as needed

    y(k) = value;
    k = k+1;
```

```
    value = k^2;
end
y = nonzeros(y)'
toc
```

```
Exercise4
```

```
y = 1×99
           1           4           9          16          25          36 ···
Elapsed time is 0.004000 seconds.
```

Question 5

for the following piece-wise function:

$$f(x) = \begin{cases} e^{x-8}, & x \le 2 \\ 3x+1, & 2 < x \le 4 \\ \dfrac{x}{x-8}, & 4 < x \ne 8 \end{cases}$$

```
type Exercise5.m
```

```
function y=Exercise5(x)
    if x==8
        disp ('the function is undefined at x = 8')
    elseif x <= 2
        y=exp(x-8);
    elseif (2 < x)&&(x<=4)
        y = 3*x + 1;
    else
        y = x / (x - 8);
    end
end
```

```
Exercise5(1)
```

```
ans = 9.1188e-04
```

```
Exercise5(2)
```

```
ans = 0.0025
```

```
Exercise5(2.5)
```

```
ans = 8.5000
```

```
Exercise5(4)
```

```
ans = 13
```

```
Exercise5(8)
```

```
the function is undefined at x = 8
```

```
Exercise5(9)
```

```
ans = 9
```