(**1 point each**) Record the output of the following MATLAB commands by completing every blank output line. If the line would return an error, write "error."

```
>> clear;
>> A = [2 0 3 5];      2  0  3  5
>> B = 1:2:7;            1  3  5  7

>> A(4)
```

ans = __5__ ✓

```
>> B - 2
```

ans = __-1 1 3 5__ ✓

```
>> A + B
```

ans = __3 3 8 12__ ✓

```
>> [B; A]
```

ans = __1 3 5 7__
      __2 0 3 5__ ✓

```
>> [A B(2:3) A(1)]
```

ans = __2 0 3 5 3 5 2__ ✓

```
>> A .^ 2
```

ans = __4 0 9 25__ ✓

```
>> A .* B
```

ans = __2 0 15 35__ ✓

```
>> sum(A)
```

ans = __10__ ✓

```
>> A(A>2)
```

ans = __3 5__ ✓

2 Two-dimensional Arrays (5 points)

(1 point each) Record the output of the following MATLAB commands by completing every blank output line. If the line would return an error, write "error."

```
>> clear;
>> a = [1 2 3; 4 5 6; 7 8 9];
>> b = [1 2 3]';

>> a(2,3)
```

$\begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}$ $3 \times 3 \times 3 \times 1$

$\begin{matrix} 1 \\ 2 \\ 3 \end{matrix}$

$3 \times 1 \times$

$\begin{matrix} 1 & & 1 \\ 4 & \ast & 2 \\ 7 & & 3 \end{matrix}$ $\begin{matrix} 1 & & 9 \\ 8 & & \\ 21 & & \end{matrix}$

✓ ans = ___6___

```
>> size(a * b)
```

✓ ans = ___3   1___

```
>> size(a(:,1) .* b)
```

✓ ans = ___3   1___

```
>> sum(a(:,1) .* b)
```

✓ ans = ___30___

```
>> 3 * ones(2,3)
```

✓ ans = ___3 3 3___
___3 3 3___

3   Character arrays (6 Points)

(1 point each) Record the output of the following MATLAB commands by completing every blank output line. If the line would return an error, write "error."

```
>> clear;
>> sentence = 'Hi, it is E7';
```

```
>> sentence(6)
```

ans = '+' ✓

```
>> sentence(1:3)
```

ans = 'Hi,' ✓

```
>> length(sentence)
```

ans = 12 ✓

```
>> [sentence(1:10), 'MATLAB', '.']
```

ans = 'Hi, it is MATLAB.' ✓

```
>> ['Y' sentence(11) upper(sentence(9))]
```

ans = 'YES' ✓

```
>> ['x = ' num2str(1.2)]
```

ans = 'x = 1.2' ✓

4   Functions (9 Points)

Consider the following function, basicstats:

```
function [ outmin, outmax, outmean ] = basicstats( data )

    outmin = min(data);  1
    outmax = max(data);  3

    tmpsum = sum(data);  6
    outmean = tmpsum / length(data);  2
```

(1 point) What must the filename for this function be?   basicStats.m

(2 points each) Record the output of the following MATLAB commands by completing every blank output line. If the line would return an error, write "error."

```
>> clear;
>> data = [1, 2, 3];
>> [outmax, outmin, outave] = basicstats(data);

>> outmax
```

        outmax = ___1___ ✓

```
>> outmin
```

        outmin = ___3___ ✓

```
>> outmean
```

        outmean = ___Error___ ✓

```
>> tmpsum
```

        tmpsum = ___Error___ ✓

5 Anonymous Functions (6 Points)

(2 points each) Record the output of the following MATLAB commands by completing every blank output line. If the line would return an error, write "error."

```
>> clear;
>> a = 6;
>> b = 2;
>> f1 = @(x) a*x^2+b;
>> f1(2)
```

$6*x^2+2$

$6*4+2$

ans = 26

```
>> a = 4;
>> b = 3;
>> f1(2)
```

ans = 26

```
>> clear;
>> f2 = @(x,y) x^2 + y + 1;
>> x = 4;
>> y = 1;
>> z = 3;
>> f2(y,z)
```

$1^2 + 3 + 1$

$1 + 3 + 1$

$(1,3)$

ans = 5

6 Subfunctions and Nested Functions (9 Points)

Consider the following function:

```
function [ y, g ] = addTwoFunctions( x, c )

        y = fancyFunction(x, c) + simpleFunction(x);
        g = @simpleFunction;

        function y = simpleFunction( M )
                y = c(1) + c(2) + x;
        end
end

function y = fancyFunction( x, c )
        y = sum(c) * x^2;
        x = 2;
end
end
```

(3 points each) Record the output of the following MATLAB commands by completing every blank output line. If the line would return an error, write "error."

```
>> clear;
>> c = [ 2, 1 ];
>> [ y, g ] = addTwoFunctions( 10, c )

>> y
```

y = _313_

```
>> g(4)
```

ans = _7_

```
>> fancyFunction( 4, c )
```

ans = _Error_

7 Polynomials (6 Points)

Given the following function:

```
function z = sumPoly( p, q )

        z = p + q;
```

(2 points each) Record the output of the following MATLAB commands by completing every blank output line. If the line would return an error, write "error."

```
>> clear;
>> a = [2, 1, 3];
>> b = [0, 2, 5];
>> sumPoly( a, b )
```

ans =   2 3 8 ✓

```
>> polyval( sumPoly( a, b ) , 0 )
```

ans =   8 ✓

(1 point) To add the coefficients of the polynomials $p(x) = x^2 - 4x + 4$ and $q(x) = 4x^5 - 3x^2 + 2x + 33$, the appropriate inputs p and q for the function sumPoly(p, q) are (circle one):

1. p = [0 0 0 4 -4 1]; q = [33 2 -3 0 0 4];
2. p = [0 0 0 1 -4 4]; q = [4 0 0 -3 2 33];   ← (circled)
3. p = [0 0 0 1 -4 4]; q = [0 0 4 -3 2 33];
4. p = [0 0 0 4 -4 1]; q = [0 0 33 2 -3 4];

(1 point) For these inputs, the output of the function sumPoly(p, q) is (circle one):

1. [4 0 0 -2 -2 37]   ← (circled)
2. [37 -2 -2 0 0 4]
3. [4 0 0 -3 2 33]
4. [1 -4 4 4 0 0 -2 -2 37]
5. [4 0 0 2 -3 37]