POLYNOMIALS MATLAB ASSIGNMENT

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Q1. Evaluate the value of the matrix polynomial 2x^2 + 3x+ 4, given that the square matrix is x = [1 -3 2; 5 1 8; 6 4 3].

```
A = [2 3 4];
s= [ 1 -3 2; 5 1 8; 6 4 3];
Z=polyvalm(A, s)
Z =

     3    -5   -26
   131    43   108
   106     8   119
```

Q2. Find a polynomial of degree 2 to fit the following data:
current 10 15 20 25 30
voltage 100 150 200 250 300

Ans:

```
current=[10 15 20 25 30];
voltage=[100 150 200 250 300];
resistance=polyfit(current,voltage,2)

resistance =

   -0.0000   10.0000   -0.0000
```

Q3. Integrated the polynomial y =4x^3+12x^2+16x+1. Take the constant of integration as

Ans:

```
y=[4 12 16 1];
x=polyint(y)

x =

     1     4     8     1     0
```

Q4. Evaluate the derivative of the polynomial y =x^4+4x^3+8x^2+16

Ans:

```
w=[1 4 8 16];
v=polyder(w)
v =

     3     8     8
```

Q5. Determine the polynomial with roots = -1, -2

Ans:

```
r =[ -1; -2];
 p=poly(r)
p =

     1     3     2
```

Q6. Divide the two polynomials a= (x^3+6x^2+16x+16) and b = (x^2 + 4s+ 8)

Ans:

```
a=[1 6 16 16];
b=[1 4 8];
[c, d]= deconv(a, b)

c =

     1     2

d =

     0     0     0     0
```

Q7. Evaluate the product of polynomials (x+3), (x+6) and (x+2).

Ans. :

```
s=[1 3];
t=[1 6];
u=[1 2];
%multiplying s and t
v = conv(s, t)

v =

     1     9    18

 % multiplying v and u
z = conv(v, u)

z =

     1    11    36    36
```

Q8. subtract the two polynomials a = (3x^3+2) and b= (x+7)

Ans. :

```
f=[3 0 0 2];
g=[0 0 1 7];
h= f-g

h =
     3     0    -1    -5
```

Q9. Solve the equation to find the roots : x^4 +3x^3 – 15x^2 -2x+9=0

Ans:

```
p = [1 3 15 2 9];
q = roots(p)
q =

  -1.4957 + 3.4799i
  -1.4957 - 3.4799i
  -0.0043 + 0.7920i
  -0.0043 - 0.7920i
```

Q10. Add the two polynomials a = (x^2+2x+1) and b= (x^3+x+5)

Ans.

```
a = [0 1 2 1];
b = [1 0 1 5];
n = a+b
n =

     1     1     3     6
```

Q11. Evaluate the value of the polynomial y=2x^2+3x+4 at x=-1,-3

Ans. :

```
%for x=-1
polynomial = [ 2 3 4];
s = -1;
value = polyval(polynomial, s)

value =

     3

%for x=3
polyn = [2 3 4];
s = -3;
value = polyval(polyn, s)
value =

    13
```