problema 1)

a)
```
function sd = sumaDiagonal(Mj, Mi, Md)
        len = length(Mj);
        sd = 0;
        for i=1:len
                if Mj(i) == Mi(i)
                        sd = sd + Md(i);
                end
        end
```
b)
```
function sd = sumaDiagonalRec(Mj, Mi, Md)
        len = length(Mj);
        if len == 0
                sd = 0;
        else
                sd = sumaDiagonalRec( Mj(2:len), Mi(2:len), Md(2:len) );
                if Mi(1) == Mj(1)
                        sd = sd + Md(1);
                end
        end
```
c)
```
function [Aj,Ai, Ad] = tresDiagonales(Mj, Mi, Md)
        len = length(Mj)
        if len == 0
                Aj = [];
                Ai = [];
                Ad = [];
        else
                [Aj,Ai, Ad] = tresDiagonales( Mj(2:len), Mi(2:len), Md(2:len) )
                if abs(Mj(1) - Mi(1)) < 2
                        Aj = [Mj(1) Aj];
                        Ai = [Mi(1) Ai];
                        Ad = [Md(1) Md];
                end
        end
```

problema 2)
a)
```
function num = binarioADecimal(v)
        len = length(v);
        num = 0;
        for i=1:len
                num = num + ( v(i) * ( 2^(len - i)) );
        end
```

b)
```
function s = signo(v)
        s = v(1);
```

c)
```
function t = tipoNumero(v)
        num = binaioADecimal(v(2:9));
        if num == 0
                t = 0;
        elseif num == 255
                t = 2;
        else
                t = 1;
        end
```

d)
```
function e = exponente(v)
        e = binaioADecimal(v(2:9));
        e = e - (2^(8-1) - 1);
```

problema 3)

a)
```
function b = ceroEsRaiz(p)
        len = length(p);
        if ( p(len) == 0 )
                b = 1;
        else
                b = 0;
        end
```

b)
```
function b = unoEsRaiz(p)
        valor = unoEsRaizAuxRec(p)
        if valor = 0
                b = 1;
        else
                b = 0;
        end
```

```
function valor = unoEsRaizAuxRec(p)
        len = length(p);
        if len == 0
                valor = 0;
        else
                valor = unoEsRaizAuxRec( p(2:len) );
                valor = valor + p(1);
        end
```

c)
```
function b = menosUnoEsRaiz(p)
        len = length(p);
        auxCoefPar = 0;
        auxCoefInpar = 0;
        sumarPar = 1;
        for i=len:-1:1
                if sumarPar
                        auxCoefPar = auxCoefPar + p(i);
                else
                        auxCoefInpar = auxCoefInpar + p(i);
                end
                sumarPar = ~sumarPar;
        end
        if auxCoefPar == auxCoefInpar
                b = 1;
        else
                b = 0;
        end
```

problema 4)
a)
```
function pi = ProdInt(v, w)
        len = length(v);
        if len == 0
                pi = 0;
        else
                pi = ProdInt( v(2:len), w(2:len) );
                pi = pi + ( v(1) * w(1) );
        end
```
b)
```
function U = GS(V)
        [m,n] = size(V);
        U(:,1) = V(:,1);
        for i=2:n
                U(:,i) = V(:,i);
                for j=i-1:-1:1
                        Ci = ProdInt(V(:,j+1), U(:,j)) / ProdInt( U(:,j), U(:,j));
                        U(:,i) = U(:,i) - ( Ci * U(:,j) );
                end
        end
```

Problema 5)

a)	b)	c)	d)
a = 1	a = 4	a = 2	a = 2
b = 3	b = 2	b = 1	b = 1