Ejercicio 4.1:

1. [a,b,c,d] = [a,[b,c,d]]. --> false
2. [a,b,c,d] = [a|[b,c,d]]. --> true
3. [a,b,c,d] = [a,b,[c,d]]. --> false
4. [a,b,c,d] = [a,b|[c,d]]. --> true
5. [a,b,c,d] = [a,b,c,[d]]. --> false
6. [a,b,c,d] = [a,b,c|[d]]. --> true
7. [a,b,c,d] = [a,b,c,d,[]]. -> false
8. [a,b,c,d] = [a,b,c,d|[]]. -> true
9. [] = \_. ----------------------> true
10. [] = [\_]. --------------------> false
11. [] = [\_|[]]. ------------------> false

Ejercicio 4.2:

1. [1|[2,3,4]]---------------> Correcto, 4 elementos
2. [1,2,3|[]]----------------> Correcto, 3 elementos
3. [1|2,3,4]---------------> Error, se quiere hacer append donde no hay una lista.
4. [1|[2|[3|[4]]]]-----------> Correcto, 4 elementos.
5. [1,2,3,4|[]] ------------> Correcto, 4 elementos.
6. [[]|[]] -------------------> Correcto, 0 elementos.
7. [[1,2]|4]----------------> Correcto , 2 elementos
8. [[1,2],[3,4]|[5,6,7]]---->Correcto, 5 elementos.

Ejercicio 4.3:

?- nth0(1, [1, 2,3], X).

X = 2.

Ejercicio 4.4:

swap12(L1,L2) :- L1 = [L1a,L1b|T], L2 = [L1b,L1a|T].

swap12([1,2,3,4,5], [2,1,3,4,5]).

True.

Ejercicio 4.5:

listtran([], []).

listtran([Hg | Tg], [He | Te]) :-

tran(Hg, He),

listtran(Tg, Te).

listtran(X, [six, nine, nine]).

X = [sechs, neun, neun].

24 ?- listtran([sechs, neun, neun], X).

X = [six, nine, nine].

Ejercicio 4.6:

twice([],[]).

twice([Ha | Ta], [Ha, Ha | Tb]) :- twice(Ta, Tb).

?- twice([1,q,p], X).

X = [1, 1, q, q, p, p].

Ejercicio 4.7:

?- member(a,[c,b,a,y]).

|

|

?- member(a,[b,a,y]).

|

|

?- member(a,[a,y]).

?- member(x,[a,b,c]).

|

|

?- member(x,[b,c])

|

|

?- member(x,[c])

|

|

?- member(x,[])

?- member(X,[a,b,c])

X=a

Ejercicio 5.1

X = 3 \* 4. -> X = 3\*4.  
X is 3\*4. -> X = 12.  
4 is X. -> ERROR: is/2: Arguments are not sufficiently instantiated  
X = Y. -> X = Y.  
3 is 1+2. -> true.  
3 is +(1,2). -> true.  
3 is X+2. -> ERROR: is/2: Arguments are not sufficiently instantiated  
X is 1+2. -> X = 3.  
1+2 is 1+2. -> false.  
is(X,+(1,2)). -> X = 3.  
 3+2 = +(3,2). -> true.  
 \*(7,5) = 7\*5. -> true.  
 \*(7,+(3,2)) = 7\*(3+2). -> true.  
 \*(7,(3+2)) = 7\*(3+2). -> true.  
 \*(7,(3+2)) = 7\*(+(3,2)). -> true.

Exercise 5.2  
  
increment(X,Y) :- Y is X + 1.

sum(X,Y,Z) :- Z is (X + Y).

Ejercicio 5.3

addone([],[]).

addone([H1|T1], [H2|T2]) :-

is(H2,+(H1,1)),

addone(T1,T2).