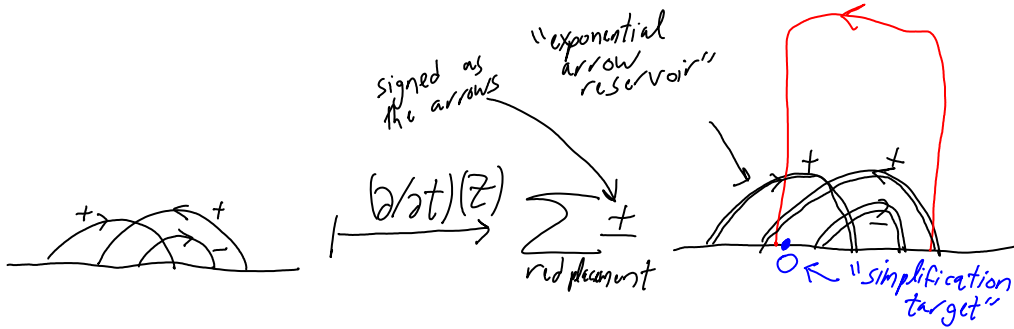


# The process:

## Initialization:

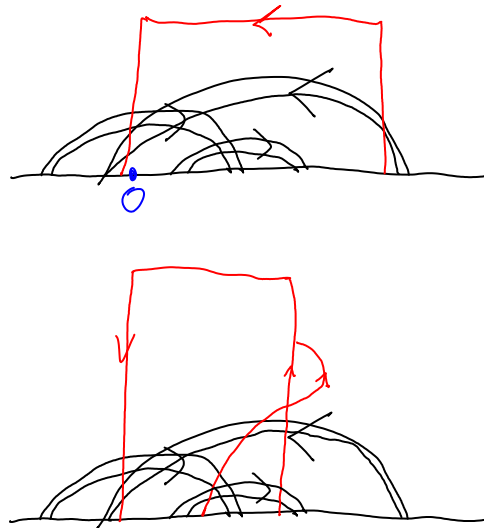


## Example: (to degree 2)



## The "it".

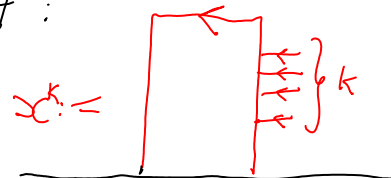
The "it" is either a red arrow hiding under one of the reservoirs and oriented the same way, or a fork under one of the reservoirs, with its front foot under the head and its back foot, which is a right foot, under the tail.



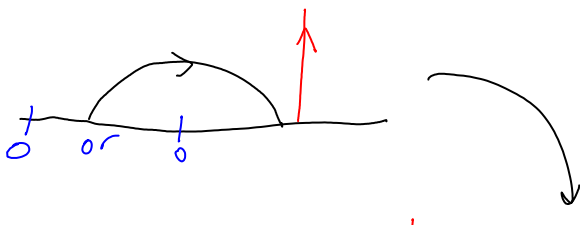
## Main process:

"pull the fork, see what's caught":

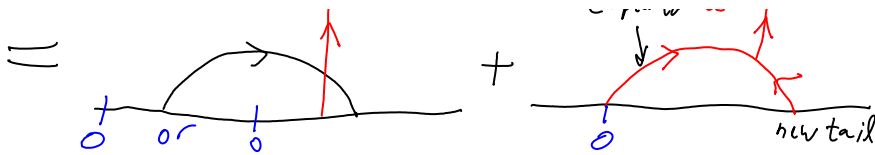
moving left across a right-headed positive arrow captures a  $-x$ :



$$X := e^x$$



captured  $-x$ .



In general, pulling a fork of dir.  $d_i$  across an arrow of heading  $d_j$  and sign  $s_j$  captures

$$-d_i \cdot s_j x$$

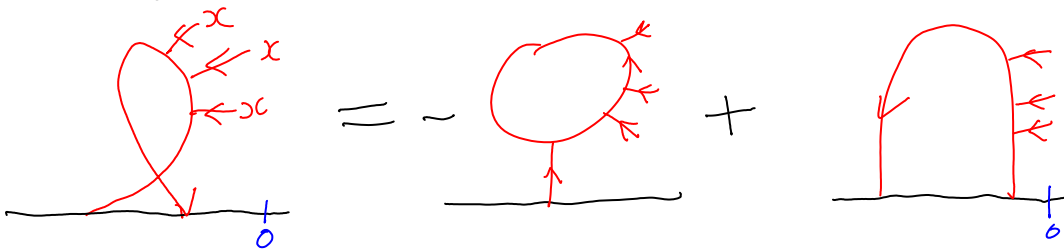
And more generally, pulling a fork of direction  $d_i$  across an arrow reservoir of heading  $d_j$  and sign  $s_j$  captures

$$d_i d_j (e^{-s_j d_j} - 1)$$

$$\boxed{\text{was } d_i (e^{-s_j x} - 1)}$$

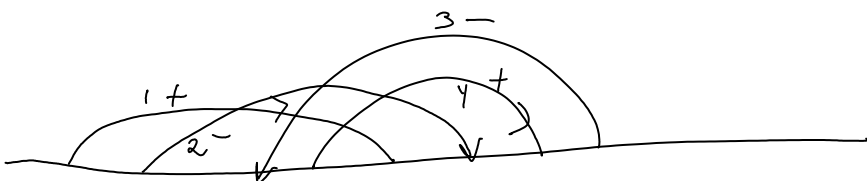
**Termination:**

moving right across the root produces an  $-x$ :



In general, moving in the direction  $d_i$  across produces a  $-d_i x$ .

Translation to matrix language: (signs unreliable)



$a_i :=$  arrow #  $i$

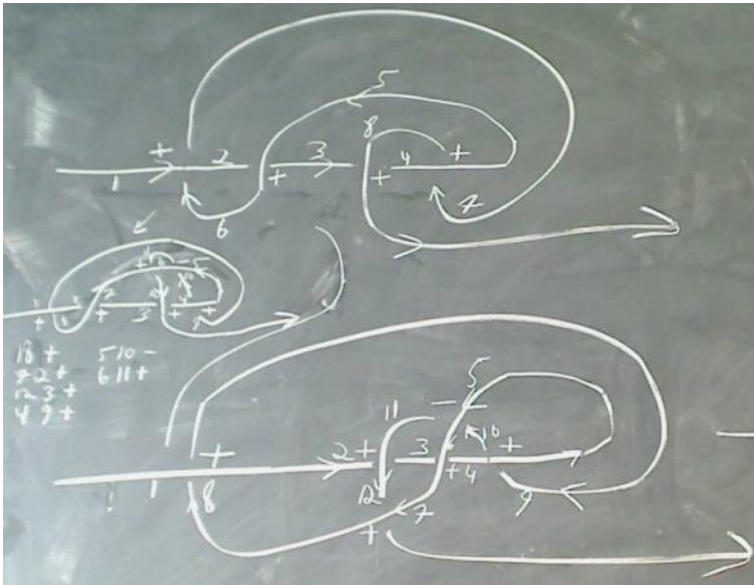
$d_i :=$  direction of  $a_i$  here:  $(++-+)$

$s_i :=$  sign of  $a_i$  here:  $(+- -+)$



**A long 4 crossing positive knot is a long trefoil**

Pasted from <<http://katlas.math.toronto.edu/drorbn/bbs/show?shot=Dror-080704-170934.jpg>>



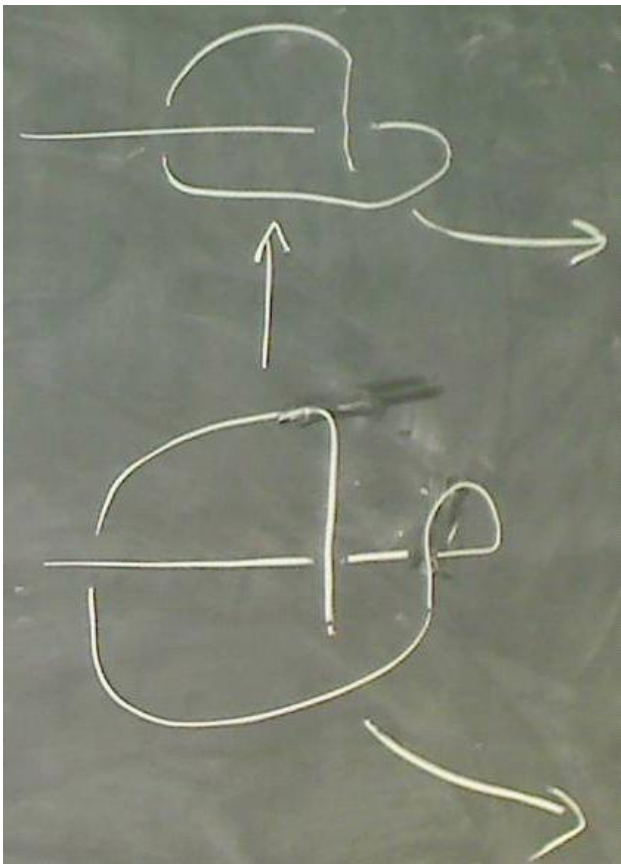
The long 4-crossing positive:  
 $16+; 52+; 83+; 47+$

$\downarrow R2$

$18+; 72+; 123+;$   
 $49+; 510-; 611+$

$\downarrow R3$

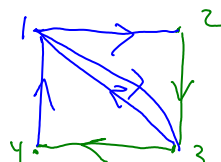
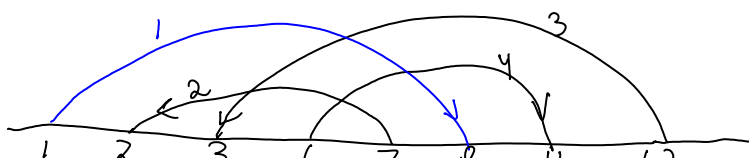
$18+; 112+; 63+;$   
 $49+; 510-; 72+$



Before and after the first R3, with some stuff removed, yet problematic:

```
Compare[GC[Ar[1, 8, +1]],
{
  GC[Ar[7, 2, +1], Ar[12, 3, +1], Ar[6, 11, +1]],
  GC[Ar[6, 3, +1], Ar[11, 2, +1], Ar[7, 12, +1]]
}
]
```

Allowed transitions  
 in green, blue



1

