

idea: to avoid nested function application

$$f(g \times y) z \rightsquigarrow f u z \quad \text{where } u = g \times y$$

$$\text{length } [] = 0$$

$$\text{length } (x:xs) = \text{length } xs + 1$$

$$(\hookrightarrow) \text{length } [], 0).$$

$$m + 1$$

$$\text{where } m = \text{length } xs$$

$$\text{length } ([x|xs], s(M)) :- \text{length } (xs, M)$$

$$(++) :: [a] \rightarrow [a] \rightarrow [a]$$

$$[] ++ ys = ys$$

$$(x:xs) ++ ys = x : (xs ++ ys)$$

$$(\hookrightarrow) \text{append } / 3$$

$$x:zs$$

$$\text{where } zs = xs ++ ys$$

$$\text{append } [], ys, ys).$$

$$\text{append } ([x|xs], ys, [x|zs]) :- \text{append } (xs, ys, zs).$$

$$\text{second} :: [a] \rightarrow a$$

$$\text{second } (_:x:_) = x$$

(\hookrightarrow)

$$\text{second } / 2$$

$$\text{second } ([_|[x|_]], x).$$

$$\text{or } \text{second } ([_ , x | _], x).$$

$$\text{or } \text{second } (.(_, .(x, _)), x).$$

or ;