In all reasonings below we assume that *a*, *b*, *c*, *d*, *k* are parameters with positive values.

1. Hyperbolic ; vertical asymptote at *x* = −*b*

;

;

;

It holds always that < 0 so the function does not attain a maximum value.

2. Michaelis-Menten (=Monod)

; ;

; , note that a vertical asymptote exists at *x*= −*b*

;

It holds always that > 0 so the function does not attain a maximum value. It, however saturates at *a*.

3. Holling type III

; ; ;

;

;

; ;

The only point where is at *x* = 0, and there the function attains a minimum value.

4. Holling type IV

; and

;

;

for *x* = 0 or with a minimum at *x* = 0 and a maximum at

5. Negative exponential

;

; ,

;

It holds that always < 0. So no minimum or maximum values;

6. Monomolecular (limited exponential growth)

;

;

;

It holds that always > 0. So no minimum or maximum values. It, however saturates at *a*.

7. Ricker

;

;

;

;

Maximum at .

8. Logistic

;

;

;

;

It holds that , so no minimum or maximum; function start at 0 and saturates at 1.

9. Power laws

;

*b* non-integer: ; not defined for negative *x*-values

*b* odd integer: ;

*b* even integer: ;

;

10. Von Bertalanffy

;

;

;

11. Shepherd

0 < *c* <1: ; not defined for *x* < 0

*c* >1: ;

;

so maximum at if *c* > 1, and minimum if *c* < 1.

12. Hassell

Vertical asymptote at *x* = −*b*

*c* <1: ; not defined for *x* < -*b*

*c* >1: ;

; for *c* >1 maximum at