

## Parametrisering af område mellem 2 funktioner

> restart

> with(plots):

> with(plot2D3D2)

[NormalVektorer, TangentVektorer, plot2D, plot3D]

(1)

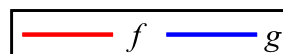
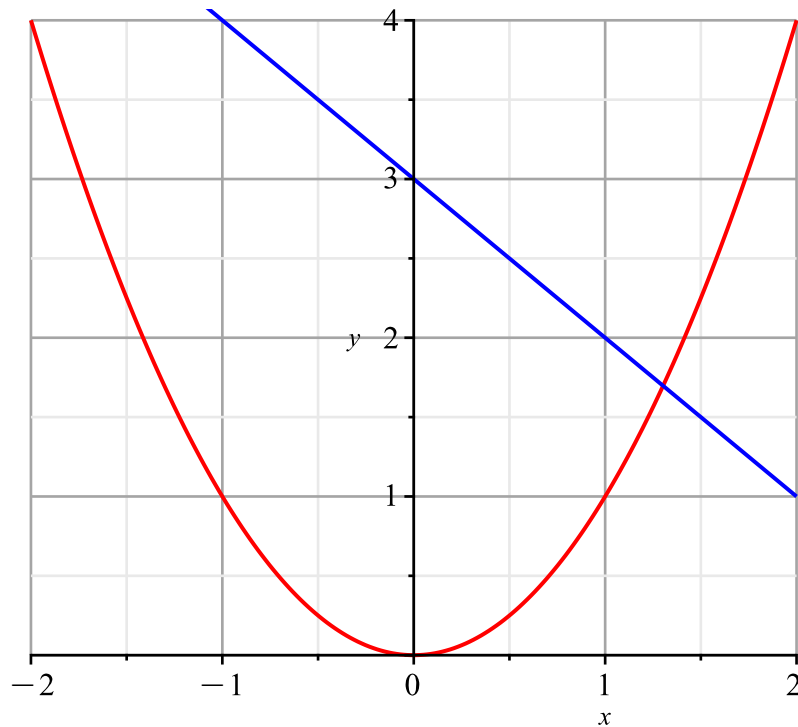
>  $f(x) := x^2$ :

>  $g(x) := 3 - x$ :

> GrafF := plot(f(x), x=-2..2, y=0..4, gridlines, color = red, legend=f):

GrafG := plot(g(x), x=-2..2, y=0..4, gridlines, color = blue, legend=g):

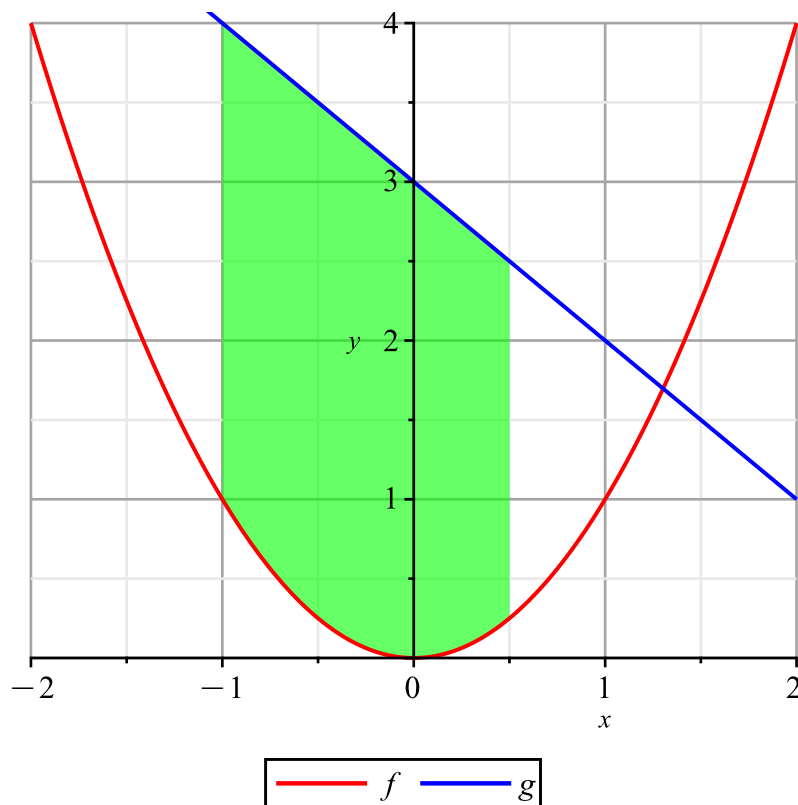
display(GrafF, GrafG)



Ønsker at parametrisere området mellem funktioner for  $x \in \left[-1; \frac{1}{2}\right]$ :

>  $Område := \text{shadebetween}\left(f(x), g(x), x=-1.. \frac{1}{2}, \text{color} = \text{green}, \text{showboundary} = \text{false}\right)$ :

display(GrafF, GrafG, Område)



## Generel formel:

Parametrisering af området mellem  $f(x)$  og  $g(x)$  for  $x$  fra  $a$  til  $b$

$$r(u, v) = (u, f(u) + v \cdot (g(u) - f(u))) \quad \text{for } u \in [a; b] \quad \text{og } v \in [0; 1]$$

Når  $v = 0$  befinder man sig i  $f(u)$ , dvs.  $f(x)$

Når  $v = 1$  befinder man sig i  $f(u) + 1 \cdot (g(u) - f(u)) = g(u)$ , dvs.  $g(x)$

Tjek:

$$\begin{aligned} > r(u, v) &:= \langle u, f(u) + v \cdot (g(u) - f(u)) \rangle : \\ &'r(u, v)' = r(u, v) \end{aligned}$$

$$r(u, v) = \begin{bmatrix} u \\ u^2 + v(-u^2 - u + 3) \end{bmatrix} \quad (2)$$

$$> INT := \left[ -1, \frac{1}{2}, 0, 1 \right]:$$

$$> display(plot2D(r(u, v), INT), color = green, gridlines, style = surface, transparency = 0.3, view = [-2..2, 0..4, ], labels = [x, y], scaling = constrained)$$

