

## Parametrisering af område mellem 2 funktioner

> restart

> with(plots) :

>  $f := x \rightarrow x^2$

$$f := x \mapsto x^2$$

(1)

>  $g := x \rightarrow 3 - x$

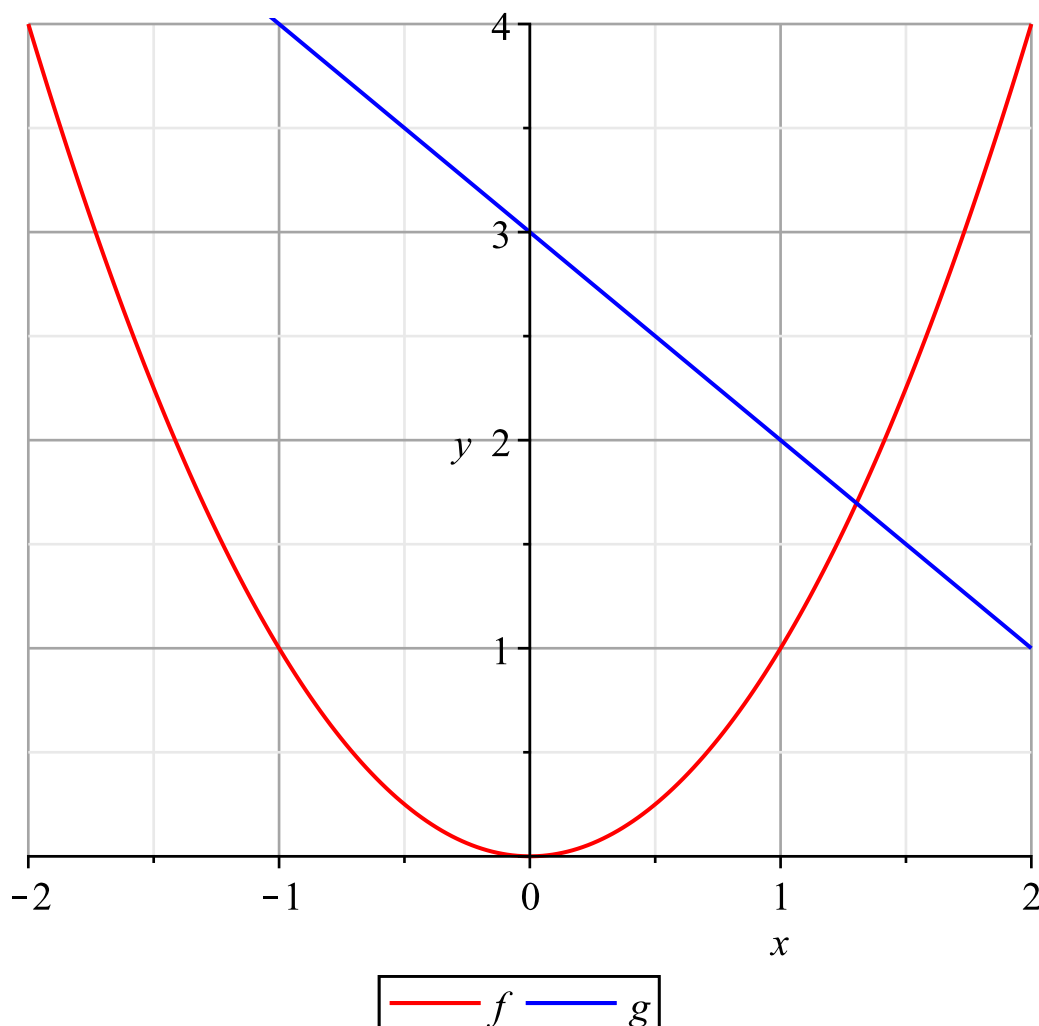
$$g := x \mapsto 3 - x$$

(2)

>  $\text{GrafF} := \text{plot}(f(x), x = -2 \dots 2, y = 0 \dots 4, \text{gridlines}, \text{color} = \text{red}, \text{legend} = f) :$

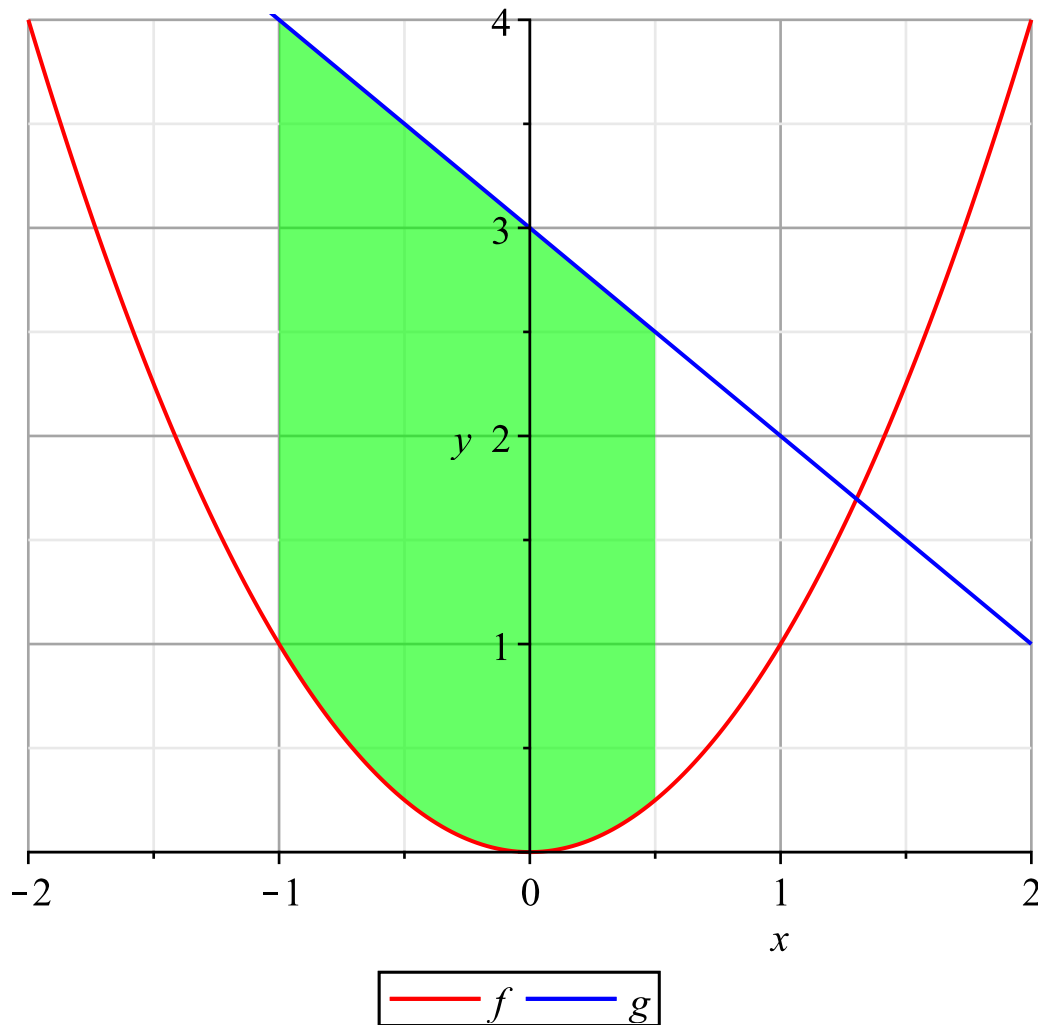
$\text{GrafG} := \text{plot}(g(x), x = -2 \dots 2, y = 0 \dots 4, \text{gridlines}, \text{color} = \text{blue}, \text{legend} = g) :$

$\text{display}(\text{GrafF}, \text{GrafG})$



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

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



**Generel formel:**

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

$r(u, v) = (u, f(u) + v \cdot (g(u) - f(u)))$  for  $u \in [a; b]$  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:**

$r := (u, v) \rightarrow (u, f(u) + v \cdot (g(u) - f(u)))$  :  
 $r(u, v) = r(u, v)$

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

$\rightarrow \text{plot3d}(\langle r(u, v)[1], r(u, v)[2], 0 \rangle, u = -1 .. \frac{1}{2}, v = 0 .. 1, \text{labels} = [x, y, " "], \text{axes} = \text{normal}, \text{orientation} = [-90, 0], \text{view} = [-2 .. 2, 0 .. 4, -1 .. 1])$

