Using Hatch function by Werner_E Level 20 , (Inclined hatch) T.Tokoro.

$$f(x) := 0.2\mathrm{i}\cdot\sqrt{5.0\cdot x-6.0}\cdot\sqrt{5.0\cdot x-14.0} \qquad (x-2)^2+y^2 = .64 \xrightarrow{solve,\,y} \begin{bmatrix} -\left(0.2\mathrm{i}\cdot\sqrt{5.0\cdot x-6.0}\cdot\sqrt{5.0\cdot x-14.0}\right) \\ 0.2\mathrm{i}\cdot\sqrt{5.0\cdot x-6.0}\cdot\sqrt{5.0\cdot x-14.0} \end{bmatrix}$$

$$g(x) := -f(x)$$

$$Hatch(f1,f2,x1,x2,\Delta x) := \left\| \begin{array}{l} H \leftarrow [NaN\ \ NaN] \\ \text{for } i \in 0..\text{trunc}\left(\frac{x2-x1}{\Delta x}\right) \\ \quad \left\| \begin{array}{l} x \leftarrow x1+i\cdot\Delta x \\ y1 \leftarrow f1(x) \\ y2 \leftarrow f2(x) \\ H \leftarrow \text{stack}\left(H, \begin{bmatrix} x & y1 \\ x & y2 \\ NaN & NaN \end{bmatrix}\right) \end{array} \right. \\ H \end{array} \right.$$

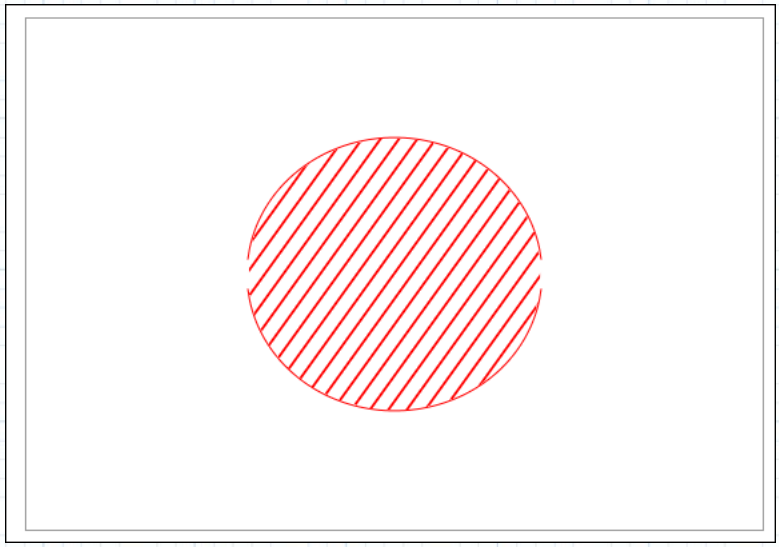
$$Hatch2(f1,f2,x1,x2,\Delta x,inc,ymax,ymin) := \left\| \begin{array}{l} H \leftarrow [NaN\ \ NaN] \\ \text{for } i \in 0-\text{trunc}\left(\frac{inc}{\Delta x}\right)..\text{trunc}\left(\frac{x2-x1}{\Delta x}\right) \\ \quad \left\| \begin{array}{l} x \leftarrow x1+i\cdot\Delta x \\ H \leftarrow \text{stack}\left(H, \begin{bmatrix} x & ymin \\ x+inc & ymax \\ NaN & NaN \end{bmatrix}\right) \end{array} \right. \\ H \end{array} \right.$$

$$Hatch3(f1,f2,x1,x2,\Delta x,inc,ymax,ymin) := \left\| \begin{array}{l} H \leftarrow [NaN\ \ NaN] \\ \text{for } i \in 0..\text{trunc}\left(\frac{x2-x1}{\Delta x}\right) \\ \quad \left\| \begin{array}{l} x \leftarrow x1+i\cdot\Delta x \\ y1 \leftarrow f1(x) \\ y2 \leftarrow f2(x) \\ \text{if } y1>y2 \\ \quad \left\| \begin{array}{l} fmax \leftarrow y1 \\ fmin \leftarrow y2 \end{array} \right. \\ \text{else if } y1<y2 \\ \quad \left\| \begin{array}{l} fmax \leftarrow y2 \\ fmin \leftarrow y1 \end{array} \right. \\ \text{else} \\ \quad \left\| \begin{array}{l} fmax \leftarrow 0 \\ fmin \leftarrow 0 \end{array} \right. \\ H \leftarrow \text{stack}\left(H, \begin{bmatrix} x & fmax \\ x & ymax \\ NaN & NaN \\ x & fmin \\ x & ymin \\ NaN & NaN \end{bmatrix}\right) \end{array} \right. \\ H \end{array} \right.$$

$D := Hatch2(f, g, 0, 4, 0.1, 2, 1.5, -1.5)$ $L := Hatch3(f, g, 0, 4, 0.01, 1, 1.5, -1.5)$

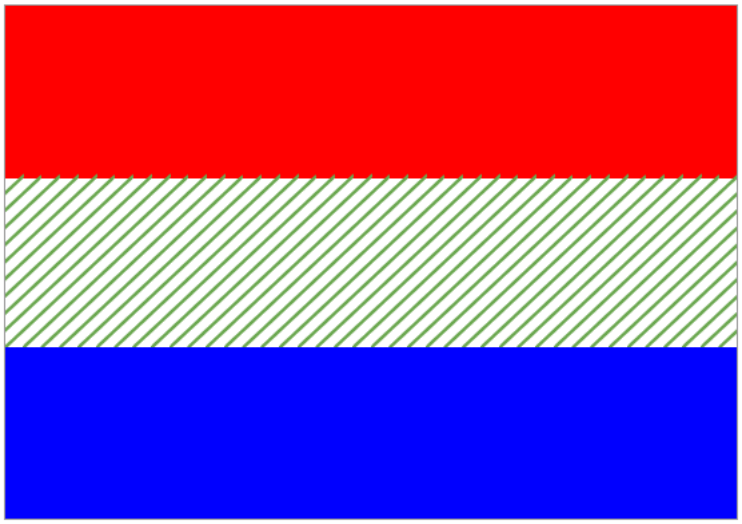
$f(x) := 1.5$ $g(x) := -1.5$ $H1 := Hatch(f, g, 0, 1.2, 0.01)$ $H2 := Hatch(f, g, 2.8, 4, 0.01)$

$f(x) := 0.2i \cdot \sqrt{5.0 \cdot x - 6.0} \cdot \sqrt{5.0 \cdot x - 14.0}$ $g(x) := -f(x)$



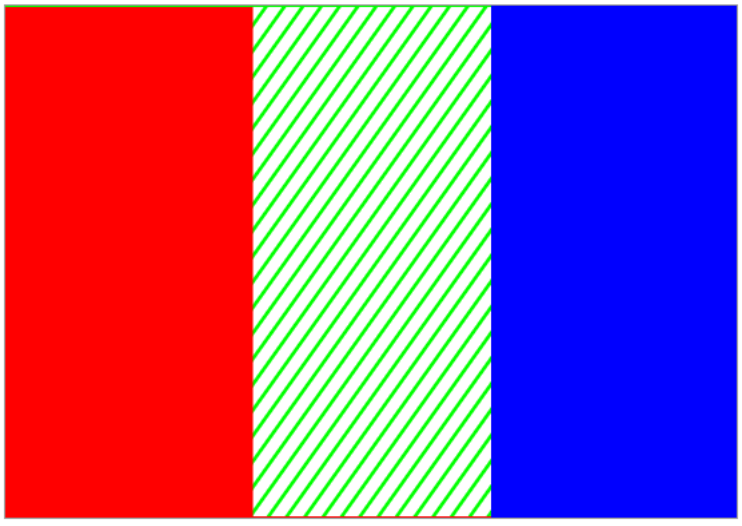
$f(x) := 1.5$ $g(x) := 0.5$ $h(x) := -0.5$ $i(x) := -1.5$

$H1 := Hatch(f, g, 0, 4, 0.01)$ $H2 := Hatch2(g, h, 0, 4, 0.1, 1, 0.5, -0.5)$ $H3 := Hatch(h, i, 0, 4, 0.01)$



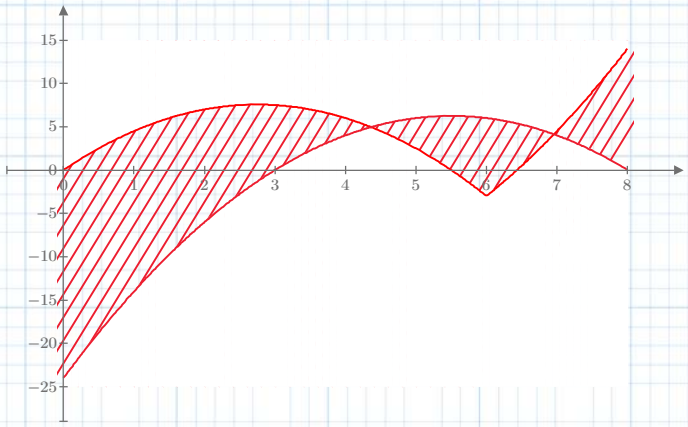
$f(x) := 1.5$ $g(x) := -1.5$

$H1 := Hatch\left(f, g, 0, \frac{4}{3}, 0.01\right)$ $H2 := Hatch2\left(g, h, \frac{4}{3}, \frac{8}{3}, 0.1, 2, 1.5, -1.5\right)$ $H3 := Hatch\left(f, g, \frac{8}{3}, 4, 0.01\right)$



$f(x) := |(x+0.5)\cdot(x-6)| - 3 \qquad g(x) := -(x-3)\cdot(x-8)$

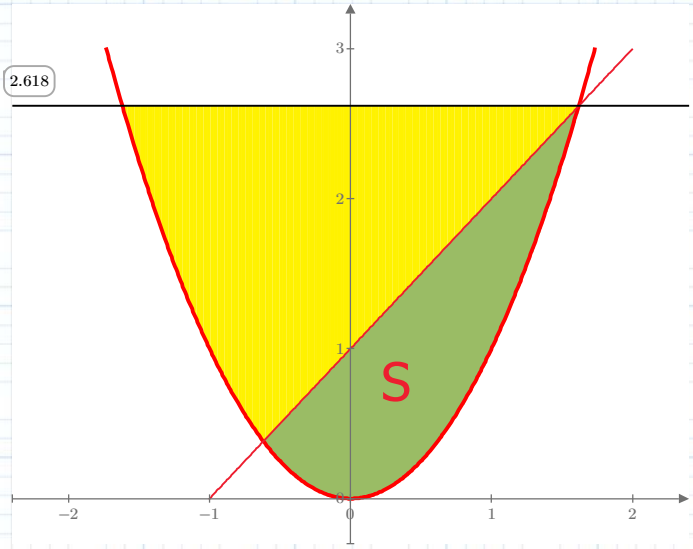
$D := Hatch2(f, g, 1.2, 6, 0.2, 3, 15, -25) \qquad L := Hatch3(f, g, 0, 8, 0.01, 0, 15, -25)$



$f(x) := x^2 \quad g(x) := x+1 \quad h(x) := up+1 \quad x^2 = x+1 \xrightarrow{solve,x} \begin{bmatrix} \frac{\sqrt{5}}{2}+\frac{1}{2} \\ \frac{1}{2}-\frac{\sqrt{5}}{2} \end{bmatrix} \quad up := \frac{\sqrt{5}}{2}+\frac{1}{2} \quad low := \frac{1}{2}-\frac{\sqrt{5}}{2}$

$H := Hatch\left(f, g, \frac{1}{2}-\frac{\sqrt{5}}{2}, \frac{\sqrt{5}}{2}+\frac{1}{2}, 0.01\right)$

$L := Hatch\left(h, f, -up, -\frac{\sqrt{5}}{2}+\frac{1}{2}, 0.01\right) \qquad D := Hatch\left(h, g, -\frac{\sqrt{5}}{2}+\frac{1}{2}, \frac{1}{2}+\frac{\sqrt{5}}{2}, 0.01\right)$



$S := \int_{low}^{up} (g(x)-f(x))\,dx \to \frac{5\cdot\sqrt{5}}{6}$

$L := \int_{-up}^{low} ((up+1)-f(x))\,dx \to \frac{\sqrt{5}}{2}+\frac{1}{6}$

$D := \int_{low}^{up} ((up+1)-g(x))\,dx \to \frac{5}{2}$

$S+L+D \to \frac{4\cdot\sqrt{5}}{3}+\frac{8}{3}$

$\int_{-up}^{up} ((up+1)-f(x))\,dx \to \frac{4\cdot\sqrt{5}}{3}+\frac{8}{3}$