Start

```
restart;
with(plots);
```

[*animate*, *animate3d*, *animatecurve*, *arrow*, *changecoords*, *complexplot*, *complexplot3d*, *conformal*, *conformal3d*, *contourplot*, *contourplot3d*, *coordplot*, *coordplot3d*, *densityplot*, *display*, *dualaxisplot*, *fieldplot*, *fieldplot3d*, *gradplot*, *gradplot3d*, *implicitplot*, *implicitplot3d*, *inequal*, *interactive*, *interactiveparams*, *intersectplot*, *listcontplot*, *listcontplot3d*, *listdensityplot*, *listplot*, *listplot3d*, *loglogplot*, *logplot*, *matrixplot*, *multiple*, *odeplot*, *pareto*, *plotcompare*, *pointplot*, *pointplot3d*, *polarplot*, *polygonplot*, *polygonplot3d*, *polyhedra_supported*, *polyhedraplot*, *rootlocus*, *semilogplot*, *setcolors*, *setoptions*, *setoptions3d*, *spacecurve*, *sparsematrixplot*, *surfdata*, *textplot*, *textplot3d*, *tubeplot*] **(1.1)**

```
with(Student[MultivariateCalculus]);
```

[*ApproximateInt*, *ApproximateIntTutor*, *CenterOfMass*, *ChangeOfVariables*, *CrossSection*, *CrossSectionTutor*, *Del*, *DirectionalDerivative*, *DirectionalDerivativeTutor*, *FunctionAverage*, *Gradient*, *GradientTutor*, *Jacobian*, *LagrangeMultipliers*, *MultiInt*, *Nabla*, *Revert*, *SecondDerivativeTest*, *SurfaceArea*, *TaylorApproximation*, *TaylorApproximationTutor*] **(1.2)**

Dobbeltintegralet

Vi jobber med denne funksjonen

$$f := (x, y) \to 2 - \frac{x}{2} - \frac{y}{3}$$

$$(x, y) \to 2 - \frac{1}{2} x - \frac{1}{3} y \quad \textbf{(2.1)}$$

Flaten

```
FLATEN := implicitplot3d(z = f(x, y), x = 0 ..2, y = 0 ..3, z = 0 ..6, axes = boxed, style = surface,
    grid = [10, 10, 10]) :
```

XY-planet

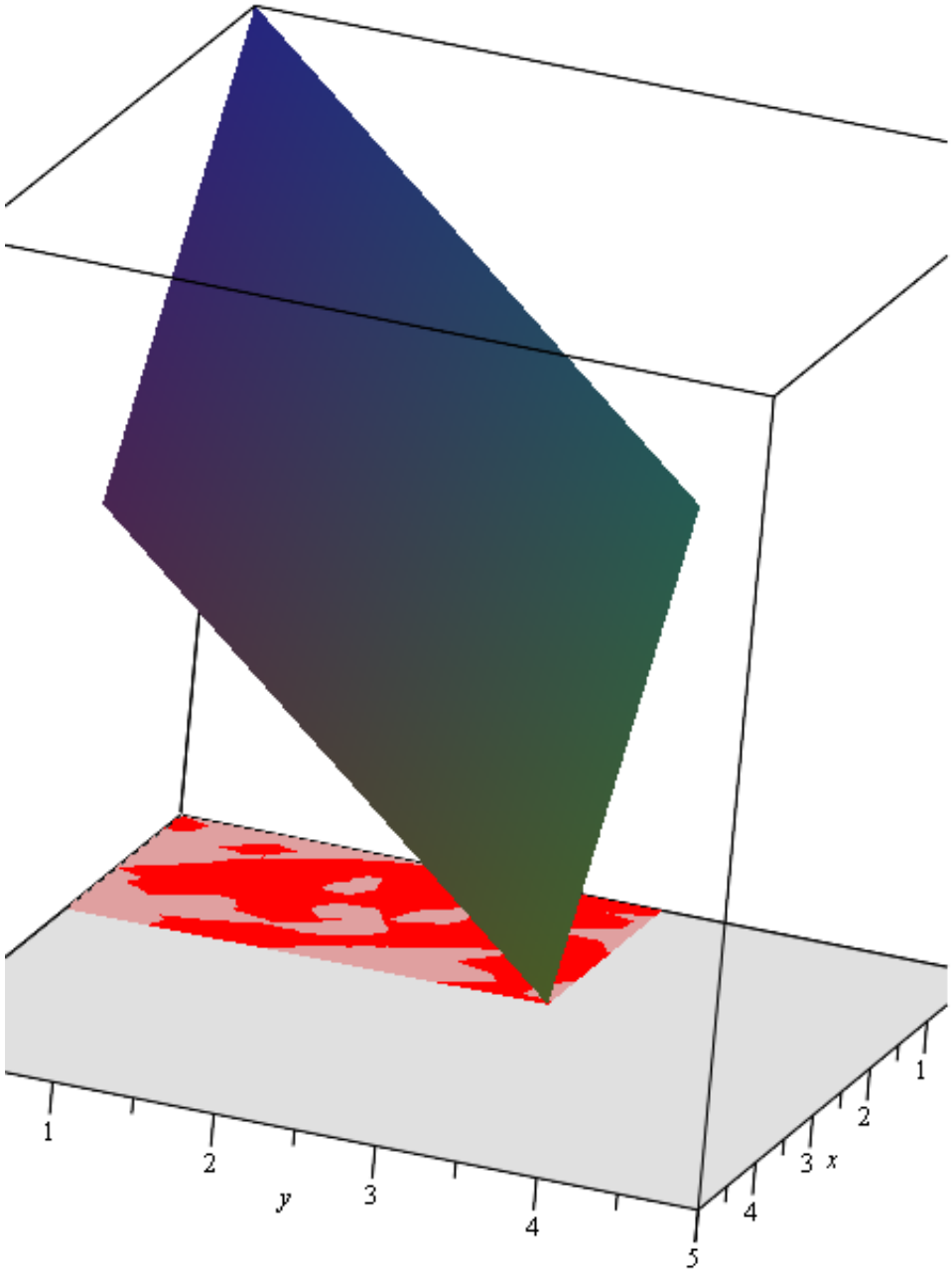
```
XYPLANET := implicitplot3d(z = 0, x = 0 ..5 , y = 0 ..5, z = 0 ..1, color = gray, style = surface,
    transparency = 0.5) :
```

R: integrasjonsområdet

```
REKT := implicitplot3d(z = 0, x = 0 ..2, y = 0 ..3, z = 0 ..1, color = red, style = surface) :
```

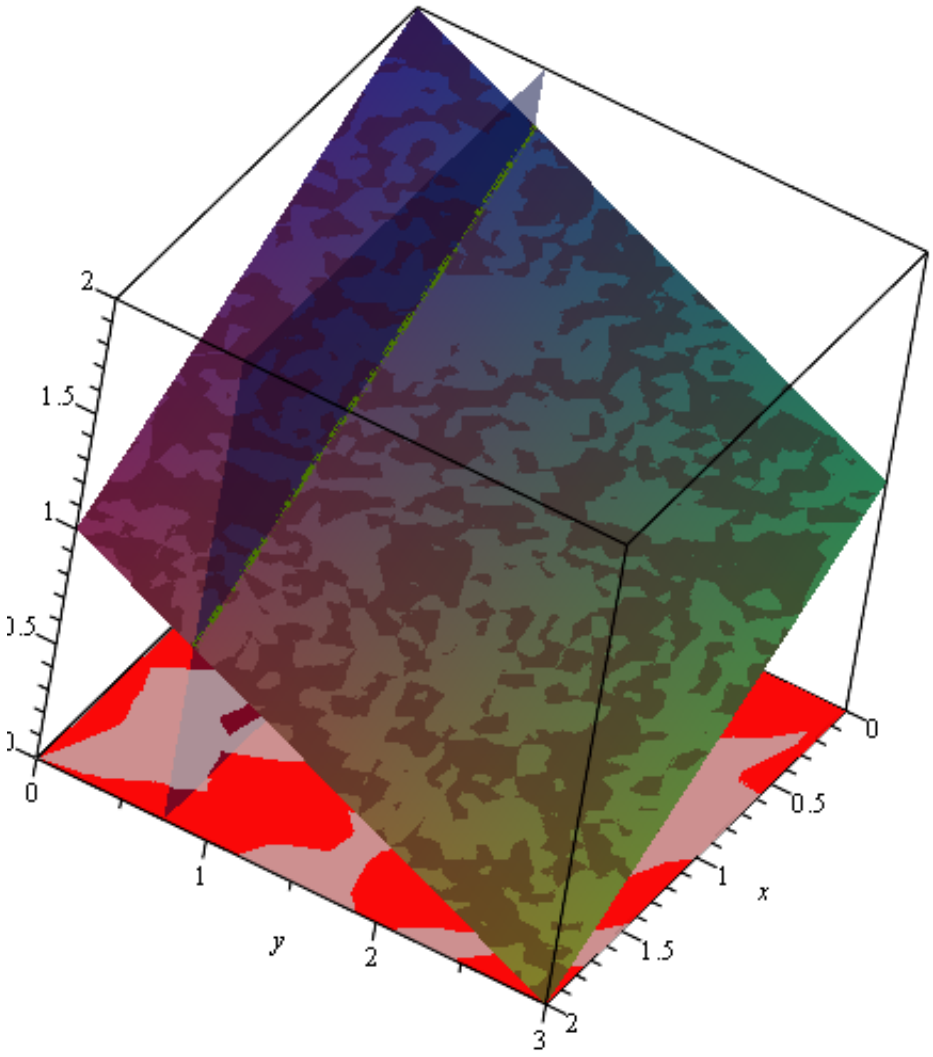
Sammen

```
display(FLATEN, XYPLANET, REKT)
```


1
2
y
3
4
5
1
2
3 x
4

Method of Slicing langs Y-aksen

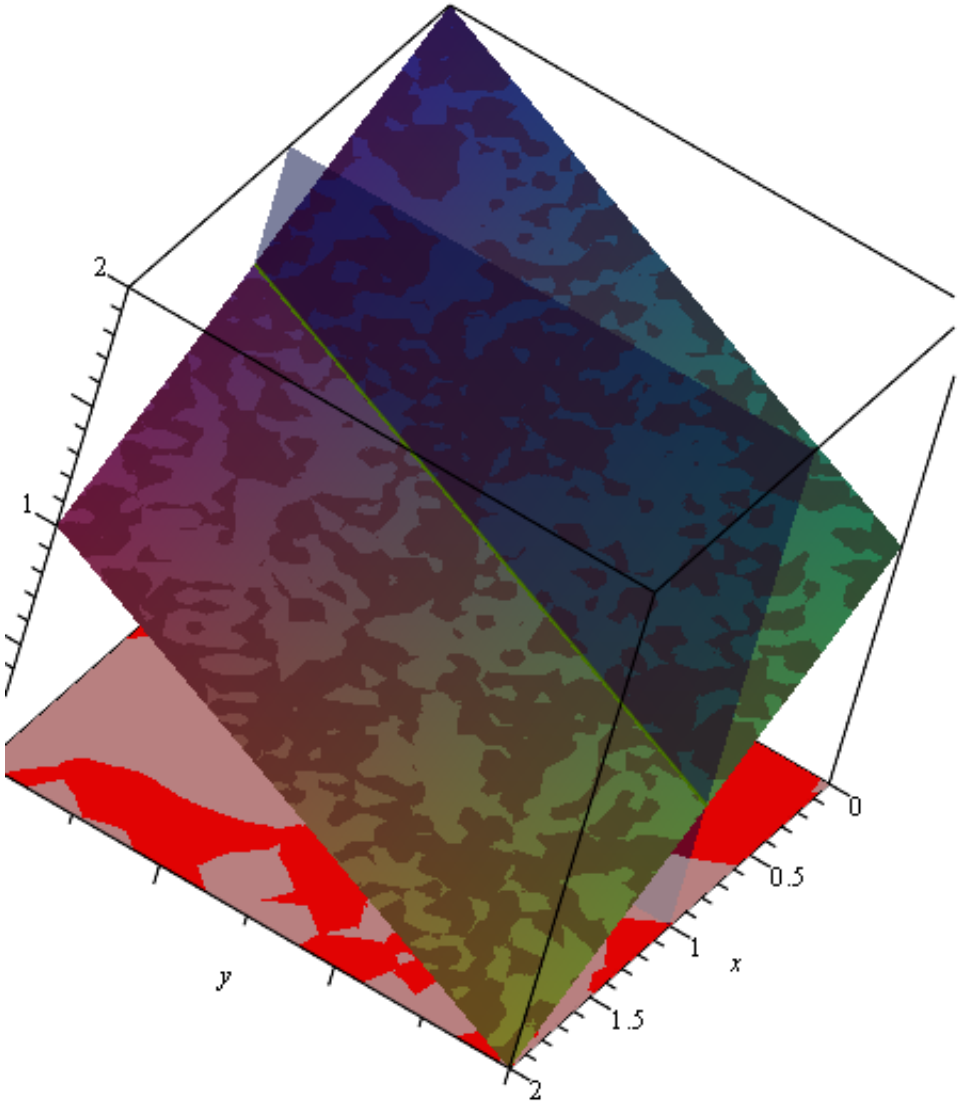
```
MethodOfSlicingY := CrossSection(f(x, y), y = 0 ..3, x = 0 .. 2, y = 0 .. 3, output = animation,
    planes = 5, axes = boxed, scaling = unconstrained) :
display(MethodOfSlicingY, FLATEN, XYPLANET, REKT);
```



The intersection of the surface $f(x, y) = 2 - \frac{1}{2}x - \frac{1}{3}y$ and one or more planes of the form $y = constant$.

Method of Slicing langs X-aksen

```
MethodOfSlicingX := CrossSection(f(x, y), x = 0 ..2, x = 0 .. 2, y = 0 .. 3, output = animation,
    planes = 5, axes = boxed, scaling = unconstrained) :
display(MethodOfSlicingX, FLATEN, XYPLANET, REKT);
```



The intersection of the surface $f(x, y) = 2 - \frac{1}{2}x - \frac{1}{3}y$ and one or more planes of the form $x = constant$.

Approksimasjon til volumet, Riemann-summ (prøv ApproximateIntTutor();)

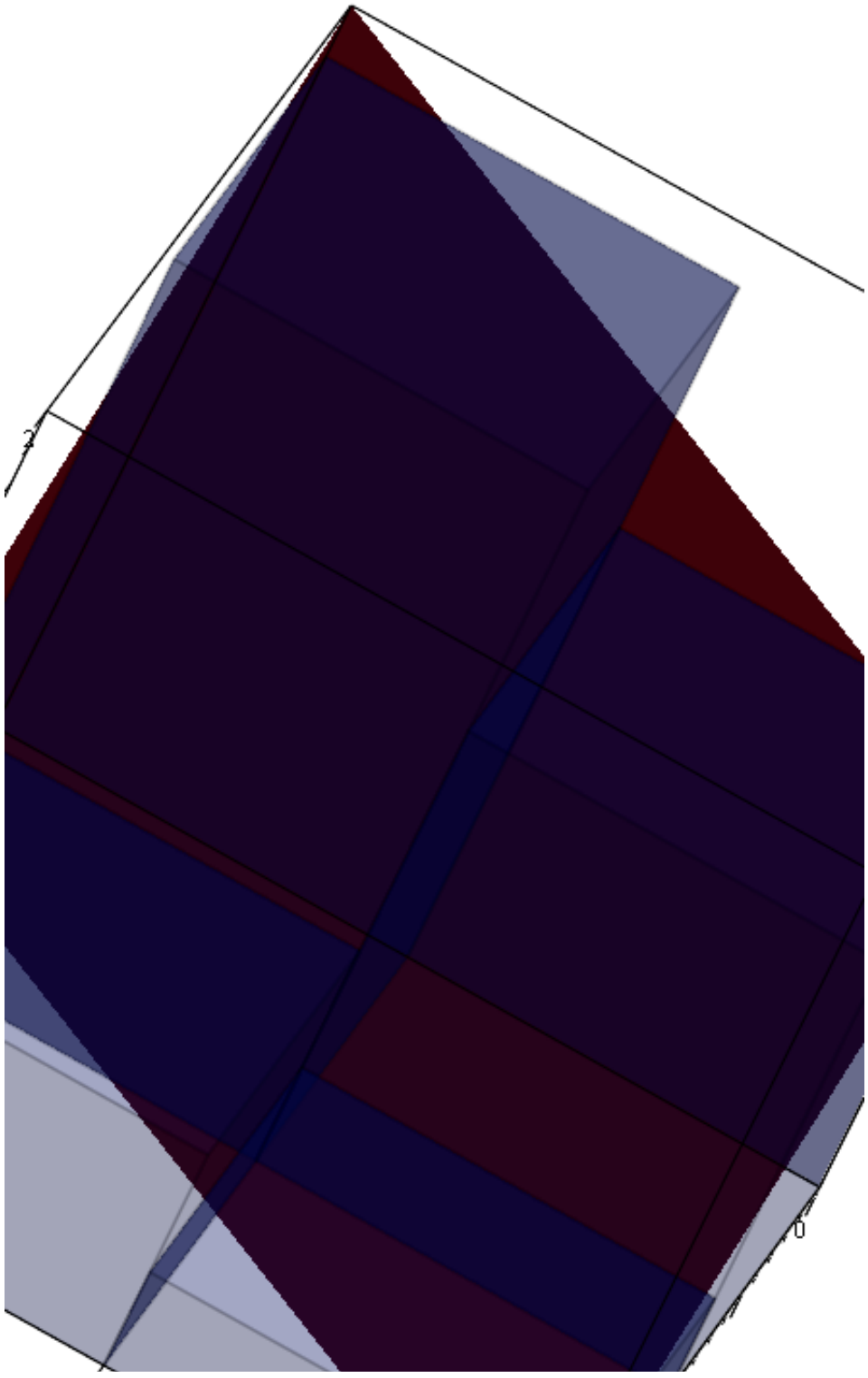
Approks **:=** ***a*** **→** ***ApproximateInt*****(***f*** (***x*****,** ***y*****)** **,** ***x*** **= 0 .. 2,** ***y*** **= 0 .. 3,** ***method*** **= random, coordinates = cartesian, partition = a,** ***output*** **=** ***plot*****,** ***axes*** **=** ***boxed*****,** ***scaling*** **=** ***unconstrained*****);**

a → Student:-MultivariateCalculus:-ApproximateInt(f (x, y), x = 0 ..2, y = 0 ..3, method **(2.2)**

= *random*, *coordinates* = *cartesian*, *partition* = *a*, *output* = *plot*, *axes* = *boxed*, *scaling* = *unconstrained*)

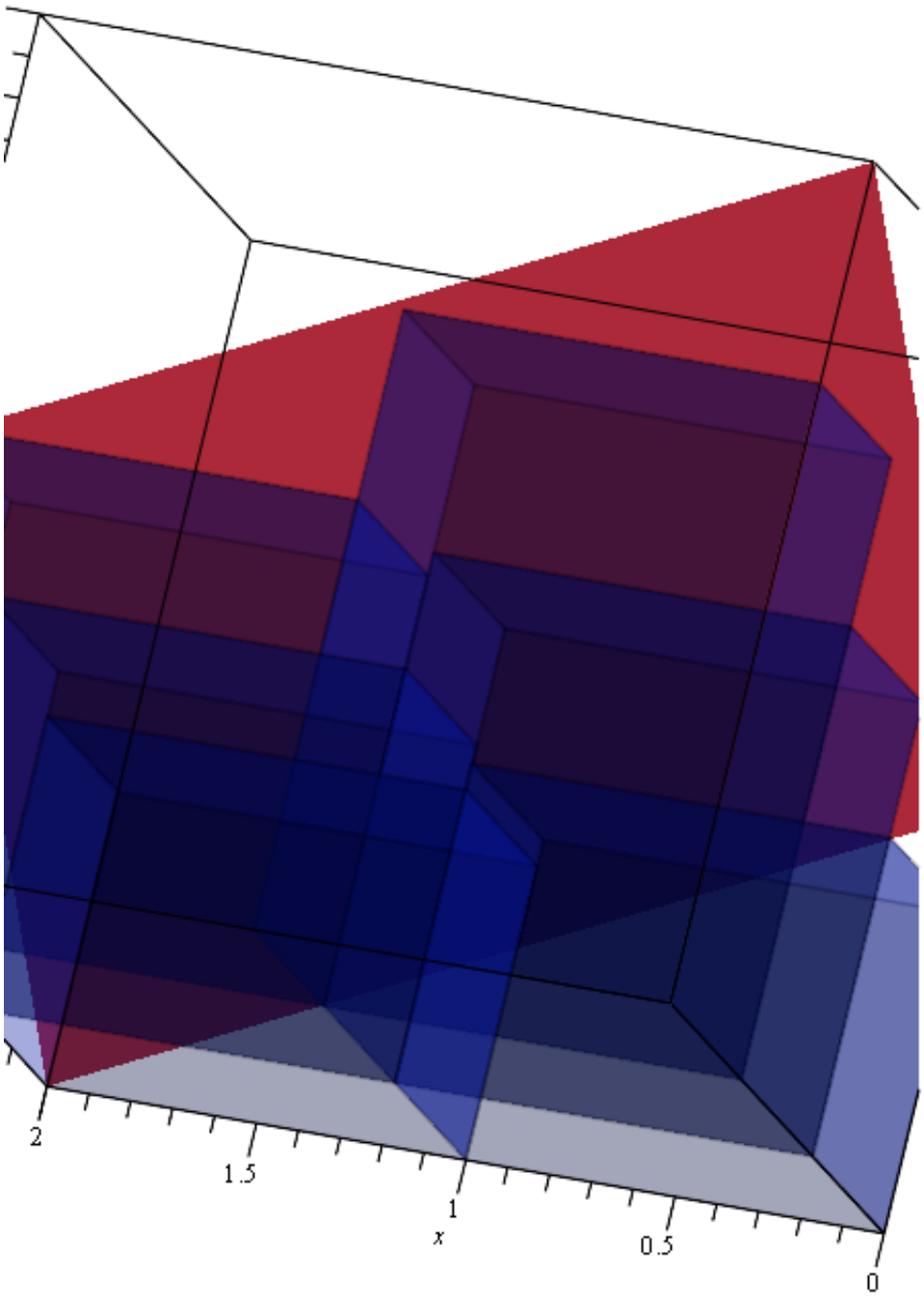
partisjon: 2x2, tilfeldige punkter, kjør kommandoen flere gang og se hvordan boksene forandrer seg

Approks([**2, 2**]);


2
0

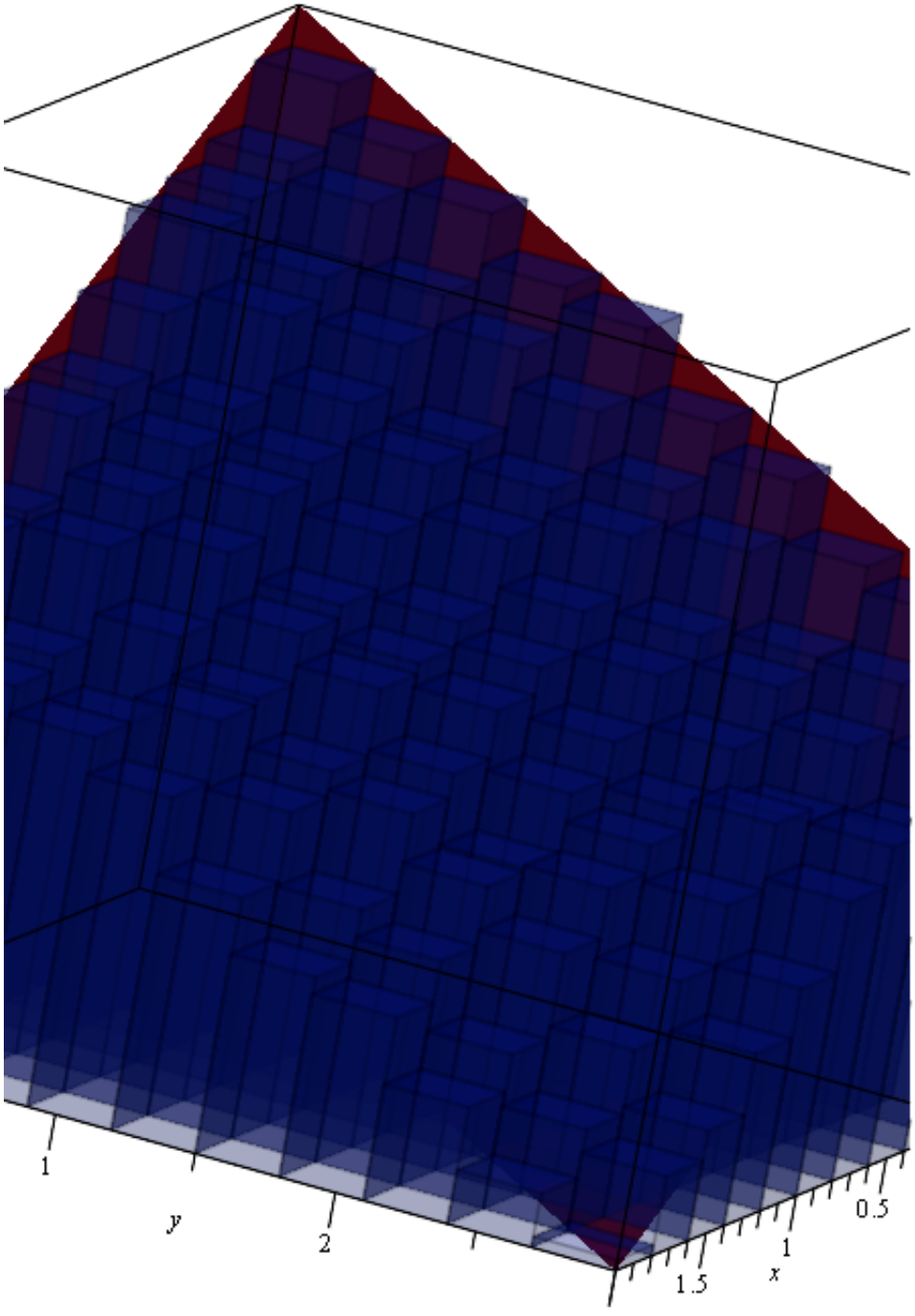
Partisjon: 2x3

```
Approks([2, 3]);
```


2
1.5
1
x
0.5
0

Partisjon: 10x10

```
Approks([10, 10]);
```


1
y
2
1.5
1
x
0.5