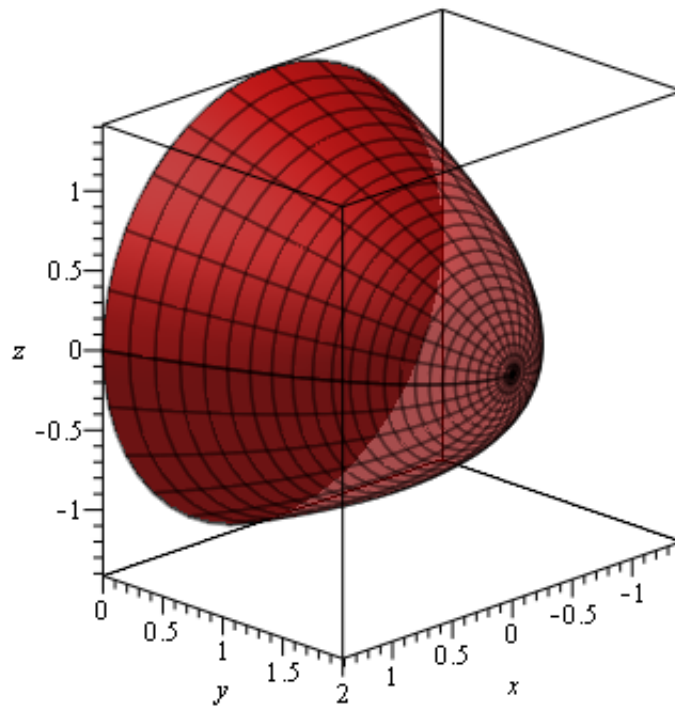


```

> with(plots) :
> Paraboloid := plot3d( [ r*cos(theta), 2 - r^2, r*sin(theta) ], r=0..sqrt(2), theta=0..2*Pi, color
    = "Red", transparency=0.3 ) :
> Skygge := plot3d( [ r*cos(theta), 0, r*sin(theta) ], r=0..sqrt(2), theta=0..2*Pi, color="Gray",
    style=patchnogrid ) :
> display(Paraboloid, Skygge, scaling=constrained, axes=boxed, labels=[x, y, z], orientation
    = [45, 70]);

```



```

> with(Student[VectorCalculus]) :
> SurfaceInt(1, [x, y, z] = Surface(⟨ r*cos(theta), 2 - r^2, r*sin(theta) ⟩, r=0..sqrt(2), theta=0..2
    *Pi));

```

$$\frac{13}{3} \pi$$

(1)

```

> with(Student[MultivariateCalculus]) :
> MultiInt(sqrt(1 + 4 * r^2), r=0..sqrt(2), theta=0..2*Pi, coordinates=polar[r, theta], output
    = steps);

```

$$\int_0^{2\pi} \int_0^{\sqrt{2}} \sqrt{1+4r^2} r dr d\theta$$

$$= \int_0^{2\pi} \left(\frac{(1+4r^2)^{3/2}}{12} \Big|_{r=0}^{\sqrt{2}} \right) d\theta$$

$$= \int_0^{2\pi} \frac{13}{6} d\theta$$

$$= \frac{13\theta}{6} \Big|_{\theta=0}^{2\pi}$$

$$\frac{13}{3} \pi$$

(2)

