

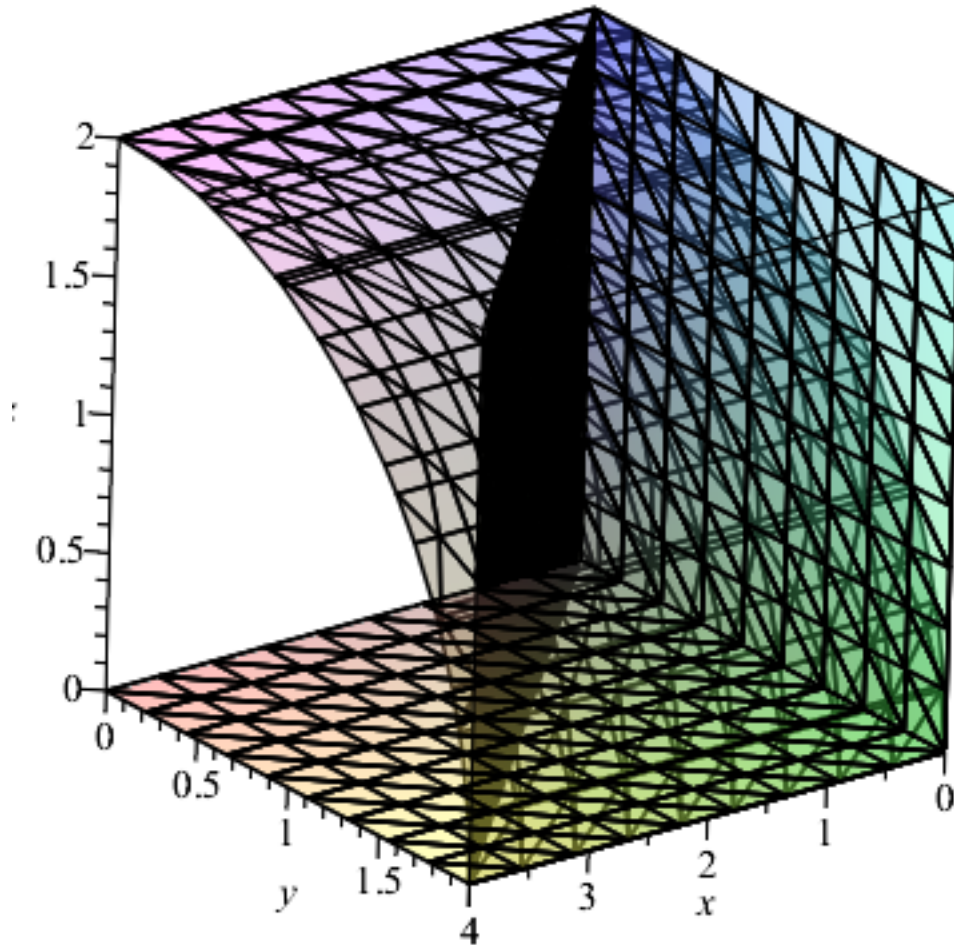
$$\int \frac{x}{x^2 + 4} dx$$

$$\frac{\ln(x^2 + 4)}{2}$$

(1)

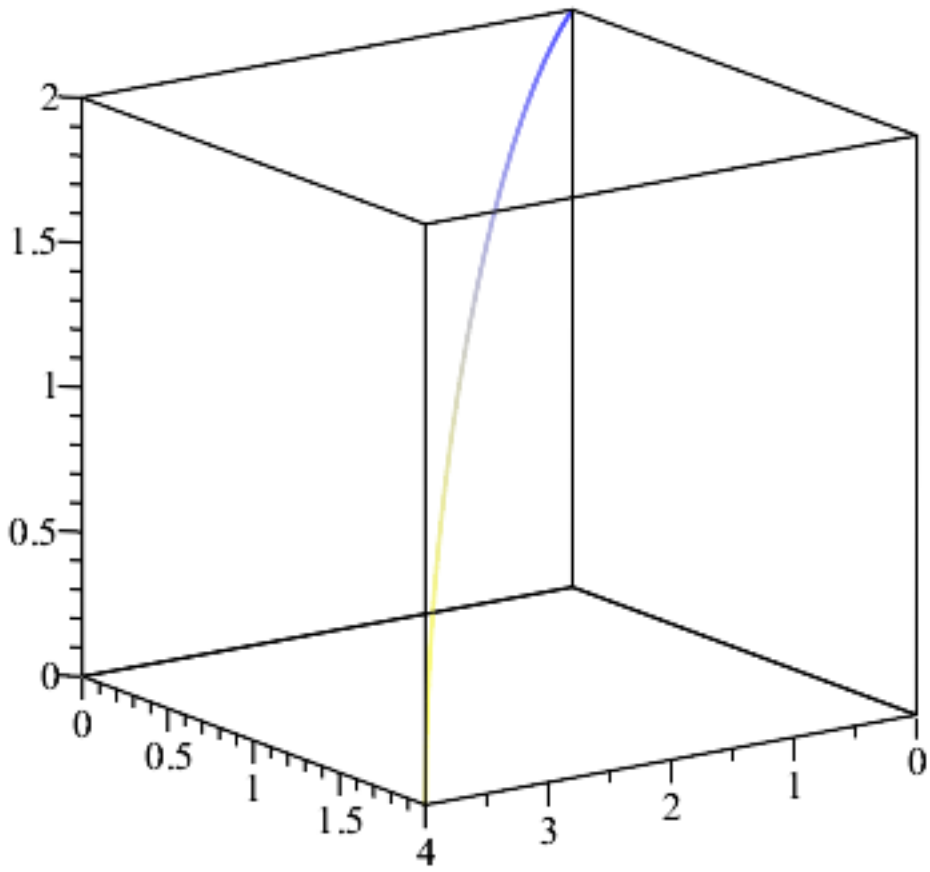
with(plots) :

funcplots := implicitplot3d([y² + z² = 4, x = 2·y, x = 0, z = 0], x = 0..4, y = 0..2, z = 0..2, transparency = .6, axes = boxed)

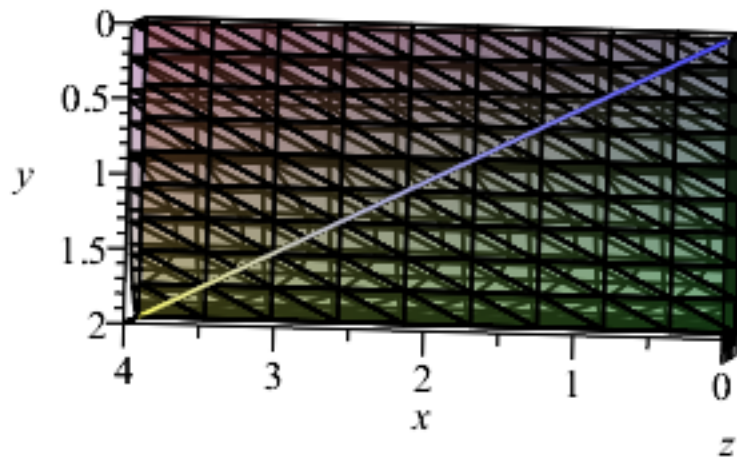


with(VectorCalculus) :

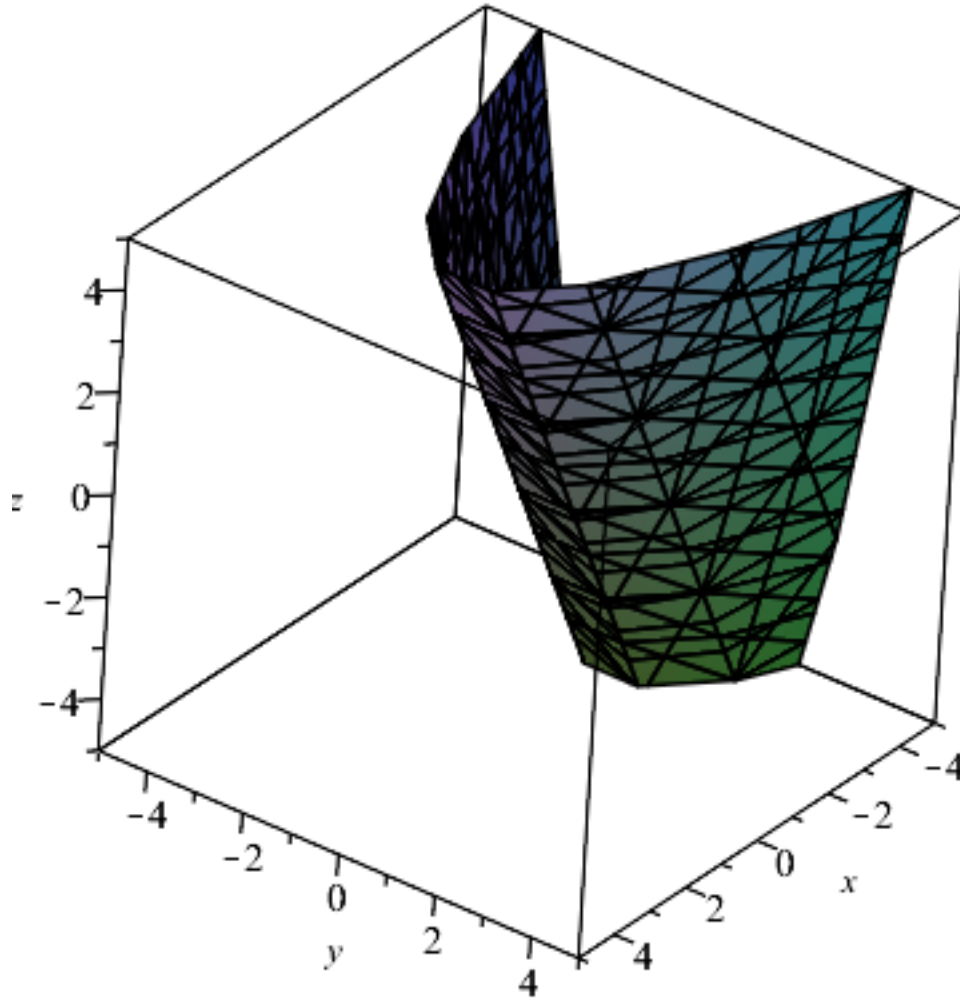
intersectionplot := SpaceCurve(<2·y, y, sqrt(4 - y²)>, y = 0..2)



`display([funcplots, intersectionplot])`



`implicitplot3d(2*x + y2 = z, x = -5 .. 5, y = -5 .. 5, z = -5 .. 5)`



$$\int_0^2 \int_{-\sqrt{4-x^2}}^{\sqrt{4-x^2}} \sqrt{4-x^2-y^2} \, dy \, dx$$

$$\frac{8\pi}{3}$$

(2)

$$\int_{-2}^2 \int_0^{\sqrt{4-y^2}} \sqrt{4-x^2-y^2} \, dx \, dy$$

$$\frac{8\pi}{3}$$

(3)

$$\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \int_0^2 \sqrt{4-r^2} \cdot r \, dr \, dt$$

$$\frac{8\pi}{3}$$

(4)