Section 15.6 - Surface Area

MVC

Consider the surface S given by a continuous function $z = f(x,y)$ with partial derivatives.

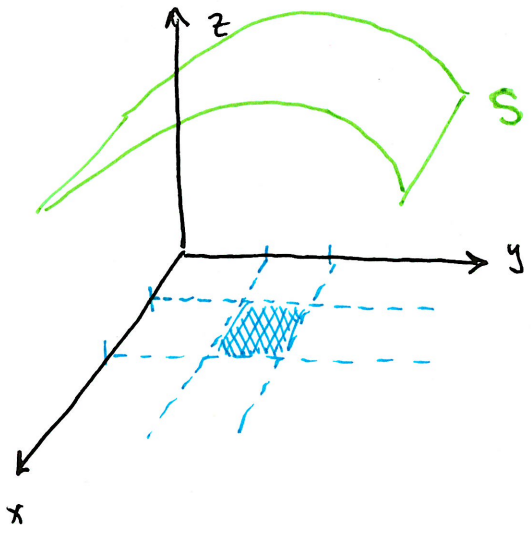
Goal: Find the Surface Area of S over a region D.

Idea: ①

②

③

④



Example Find the area of part of the paraboloid $z = x^2 + y^2$ that lies under the plane $z = 4$.

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- Extra Examples

#9. The part of the surface $z = xy$ that lies within the cylinder $x^2 + y^2 = 1$. Find the area.

#21. Show that the area of the part of the plane $z = ax + by + c$ that projects onto a region D in the xy-plane with area $A(D)$ is $\sqrt{a^2 + b^2 + 1} \cdot A(D)$.

#24. Find the area of the surface created when $y^2 + z^2 = 1$ intersects $x^2 + z^2 = 1$.