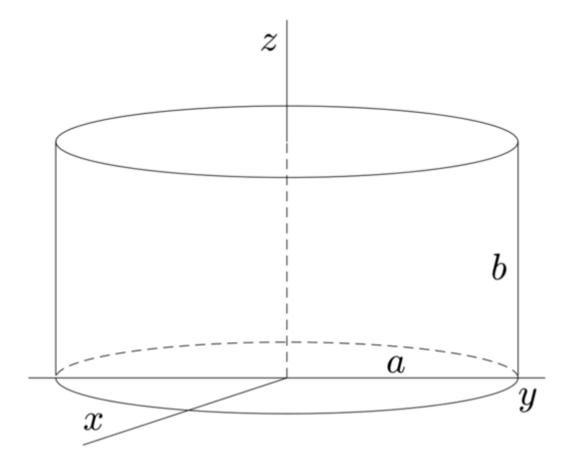
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## Surface Area of a Cylinder

Compute the lateral surface area  $A=\int_S\,dS$  of a cylinder (see figure) in two ways.



- (a) Unroll the cylinder and compute the area of the resulting rectangle.
- (b) Define the cylinder parametrically as

 $m{r}=a\cos heta\,m{i}+a\sin heta\,m{j}+z\,m{k}, \qquad ext{for } 0\leq z\leq b \quad ext{and} \quad 0\leq heta\leq 2\pi,$  and compute the surface integral.



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