Question
Evaluate the following double integral by inspection.
$\iint_R \sqrt{b^2 - y^2} \, dA$,
where R is the rectangle $0 \le x \le a$, $o \le y \le b$.
Answer

$\iint_R \sqrt{b^2 - y^2} \, dA$
= volume of quarter cylinder
= $\frac{1}{4}(\pi b^2)a = \frac{1}{4}\pi a b^2$

$z = \sqrt{b^2 - y^2}$