

VI. C. Surface Area Progression

Surface Area Progression

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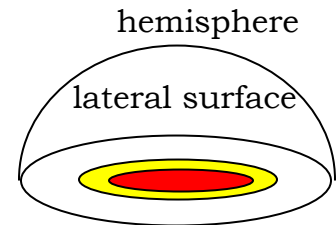
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“Can” refers to a cylinder that contains a sphere of radius r .

The can’s height is $2r$ and the base radius is r .

“Cone” is a cone with base radius r and height $2r$.

circle	πr^2
hemisphere lateral surface only	$2\pi r^2$
hemisphere total surface area	$3\pi r^2$
sphere	$4\pi r^2$
lateral surface area of can	$4\pi r^2$
lateral surface area of can + bottom	$5\pi r^2$
total surface area of can	$6\pi r^2$
total surface area of cone	$\pi r^2(1+\sqrt{5})$



Volume Progression

Same terminology as above.

cone volume	$\frac{2}{3}\pi r^3$
hemisphere volume	$\frac{2}{3}\pi r^3$
can minus sphere volume	$\frac{2}{3}\pi r^3$
sphere volume	$\frac{4}{3}\pi r^3$
volume of two-tennis-ball can minus ball volumes	$\frac{4}{3}\pi r^3$
can minus cone volume	$\frac{4}{3}\pi r^3$
can volume	$\frac{6}{3}\pi r^3 = 2\pi r^3$
volume of three-tennis-ball can minus ball volumes	$\frac{6}{3}\pi r^3 = 2\pi r^3$

