Assignment 1

AI1110: Probability and Random Variables

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Question 6(c) A hemispherical and a conical hole is scooped out of a solid wooden cylinder. Find the volume of the remaining solid where the measurements are as follows:
The height of the solid cylinder is 7 cm ,radius of each of hemisphere,cone and cylinder is 3 cm. Height of cone is 3 cm.
Give your answer correct to the nearest whole number. Take π=$\frac{22}{7}$
Solution. The various parameters involved in this question are listed in Table

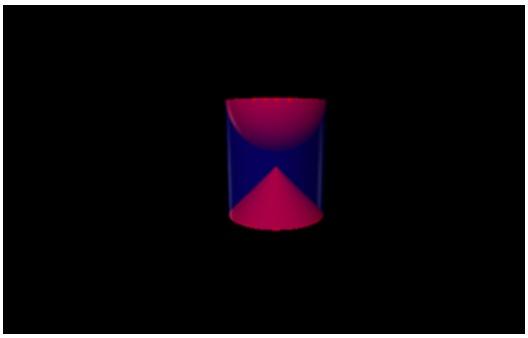

TABLE I
VARIABLES USED

Parameter	Symbol	Value/Formula
Radius of cylinder(same as cone and hemisphere)	R	3 cm
Height of cone removed	h	3 cm
Height of cylinder	H	7 cm
Volume of cylinder	V_1	$\pi R^2 H$
Volume of cone	V_2	$\frac{1}{3}\pi R^2 h$
Volume of hemisphere	V_3	$\frac{2}{3}\pi R^3$

According to question Hemisphere, Cone are removed from Cylinder

$$\therefore \text{remaining volume} = V_1 - V_2 - V_3 \quad (1)$$

$$= \pi R^2 H - \frac{1}{3}\pi R^2 h - \frac{2}{3}\pi R^3 \quad (2)$$

Substituting the values above we get,

$$\approx 113.142 cm^3$$