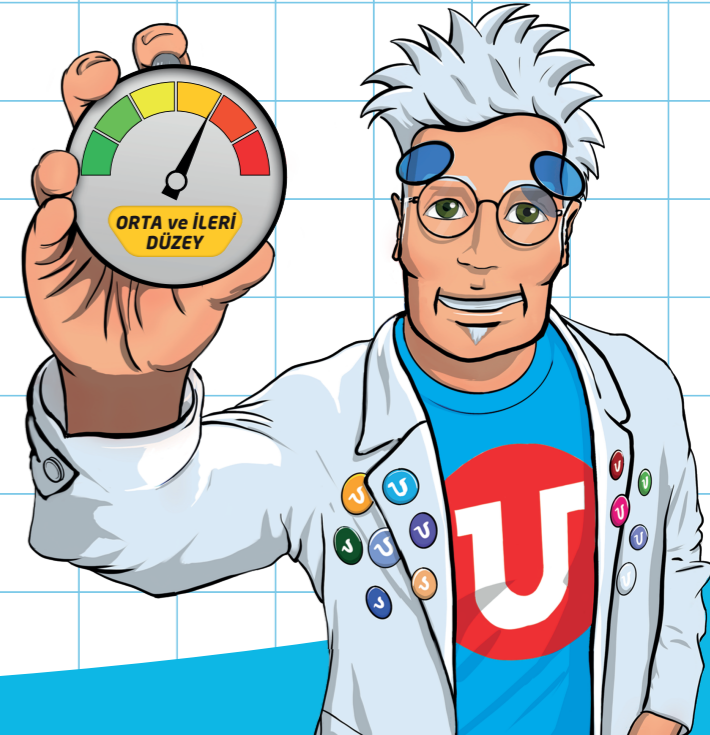


2.ÜNİTE



TYT Orta ve İleri Düzey Fizik Soru Bankası

Hacim



TAMER YALÇIN

HACİM

CİSİMLERİN HACİMLERİNİN ÖLÇÜLMESİ

HACİM BİRİMLERİ

DÜZGÜN GEOMETRİK ŞEKİLLİ CİSİMLERİN HACİMLERİ

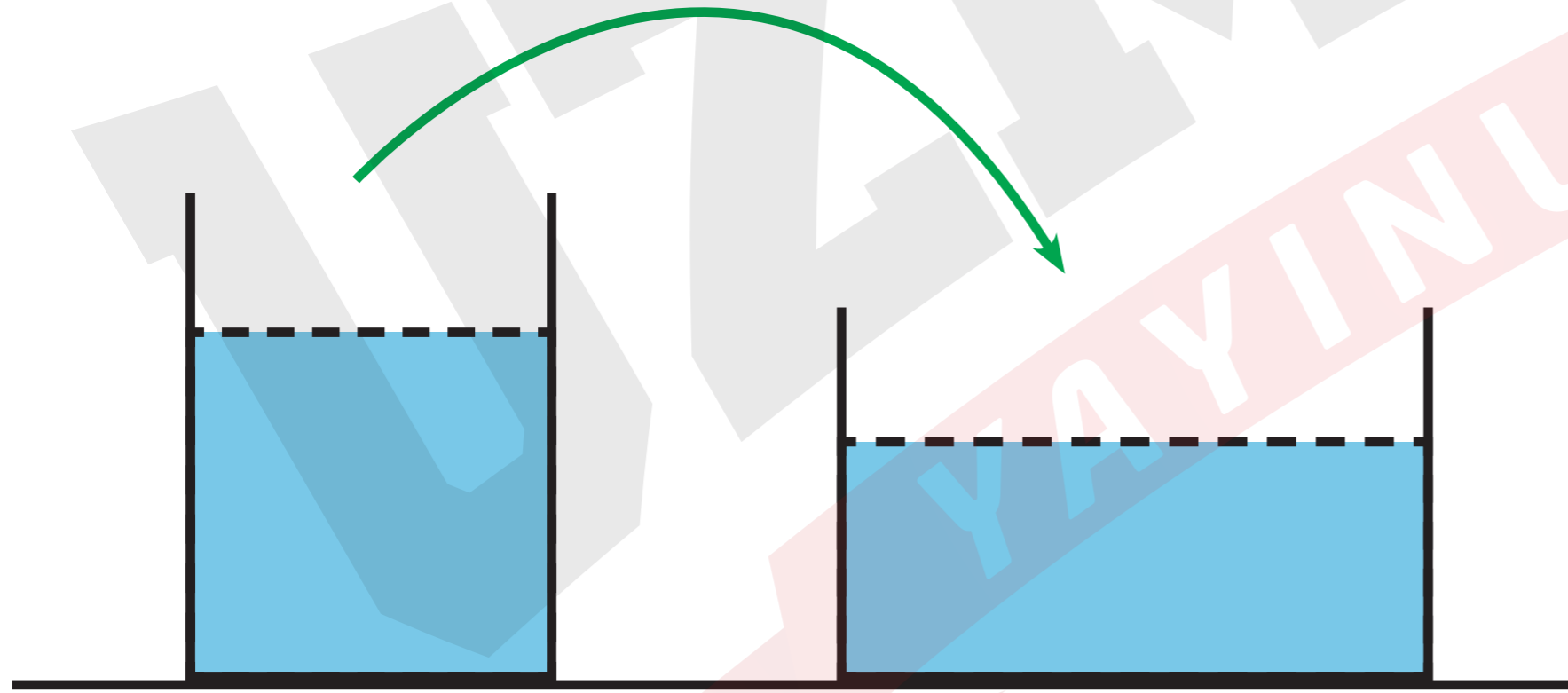
HACİM

→ Bu konudan TYT'de son üç yılda bir soru geldi.



HACİM

- Maddelerin evrende kapladığı yer.
- Maddelerin ortak özelliklerinden biri.
- SI birim sisteminde birimi m^3 tür.
- Hacim türetilmiş ve skaler büyüklüktür.



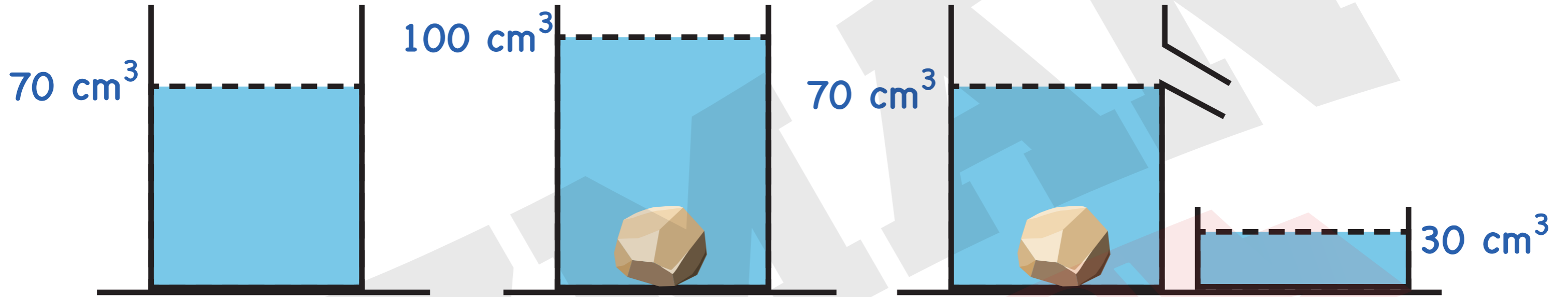
- Sıvı K kabından L kabına döküldüğünde hacmi değişmez.



K

L

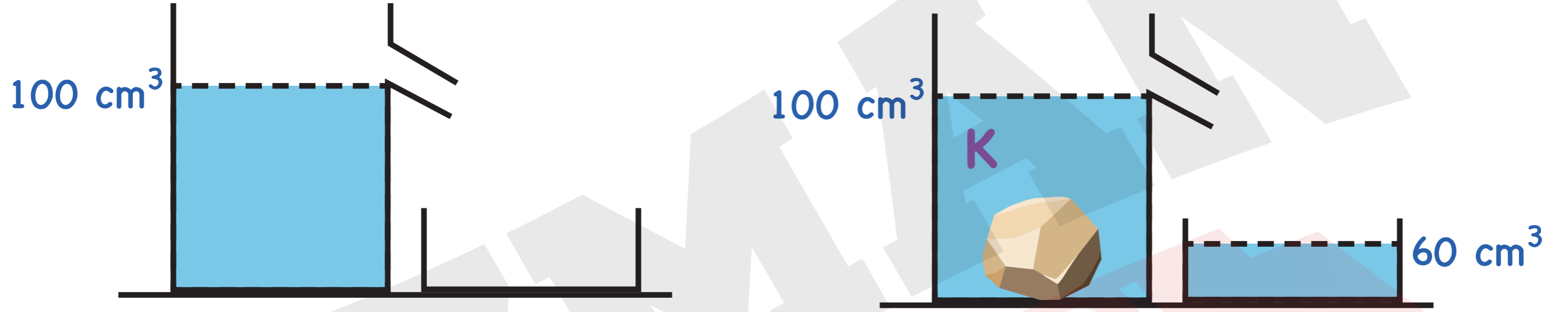
CİSİMLERİN HACİMLERİNİN ÖLÇÜLMESİ



$$V_{\text{taş}} = 100 - 70 = 30 \text{ cm}^3$$

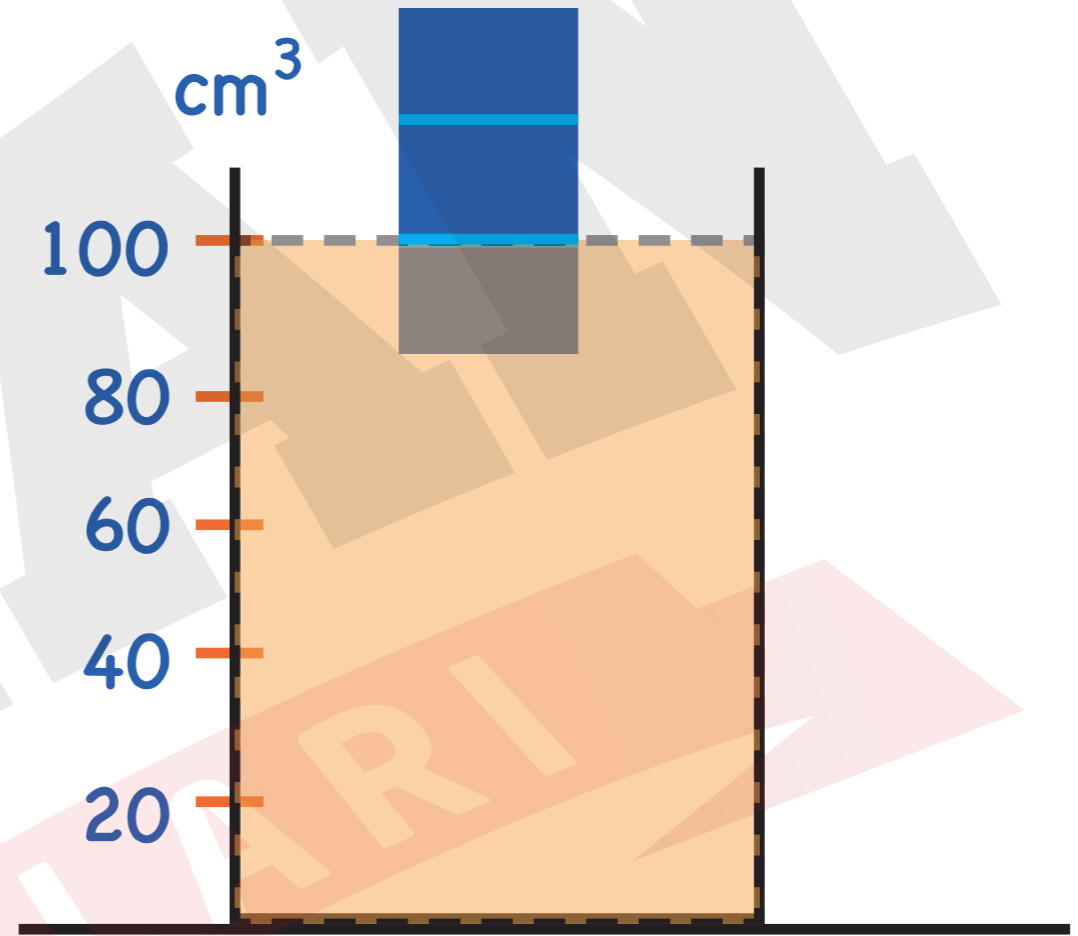
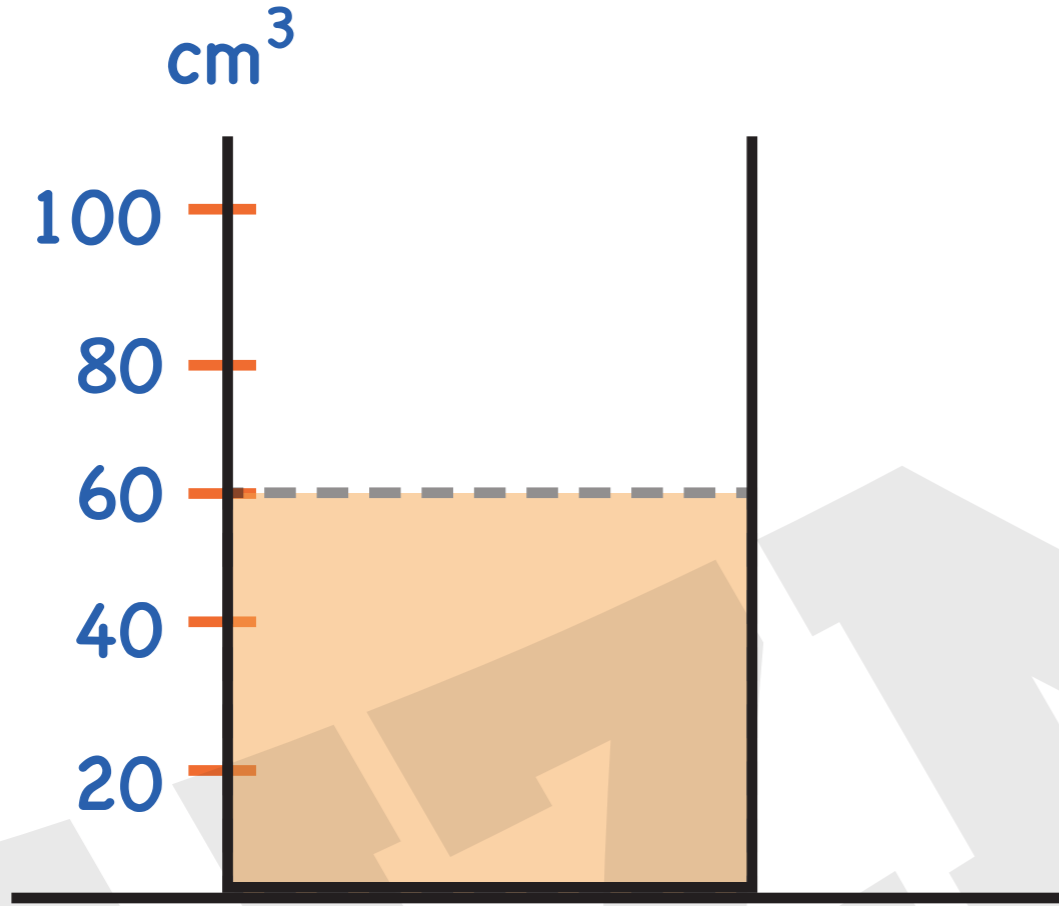
$$V_{\text{taş}} = V_{\text{taşan su}} = 30 \text{ cm}^3$$

Örnek:



$$V_K = 60 \text{ cm}^3$$

Örnek:

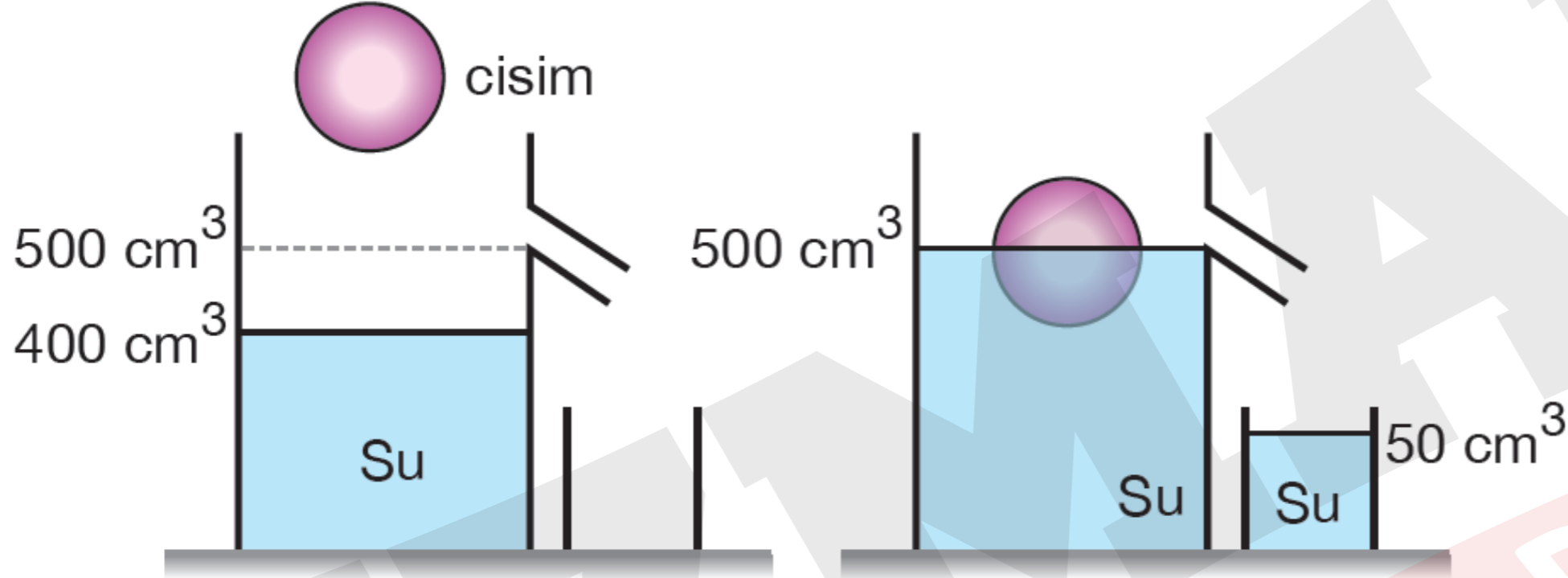


$$\frac{V_L}{3} = 100 - 60$$

$$V_L = 120 \text{ cm}^3$$



Örnek:

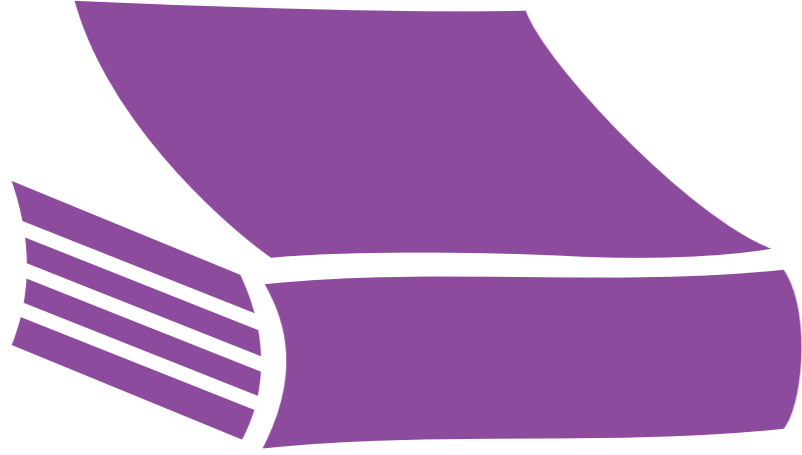


Bir cisim, 400 cm^3 çizgisine kadar su dolu dereceli silindirik kabına şekildeki gibi yavaşça bırakıldığında cismin hacminin yarısı suya batıyor ve kaptan 50 cm^3 su taşıyor.

Buna göre, cismin hacmi kaç cm^3 'tür?

- A) 200 B) 300 C) 400 D) 500 E) 600

HACİM BİRİMLERİ



400 cm³

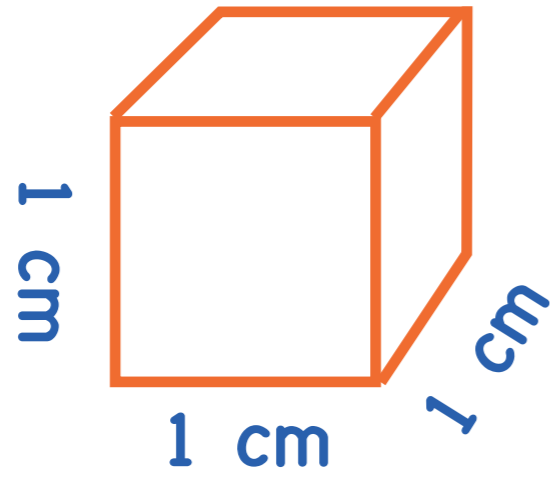


10 000 000 000 cm³ = 2800GT



1 L

→ Farklı büyüklükteki hacim değerleri için farklı birimler kullanılır.

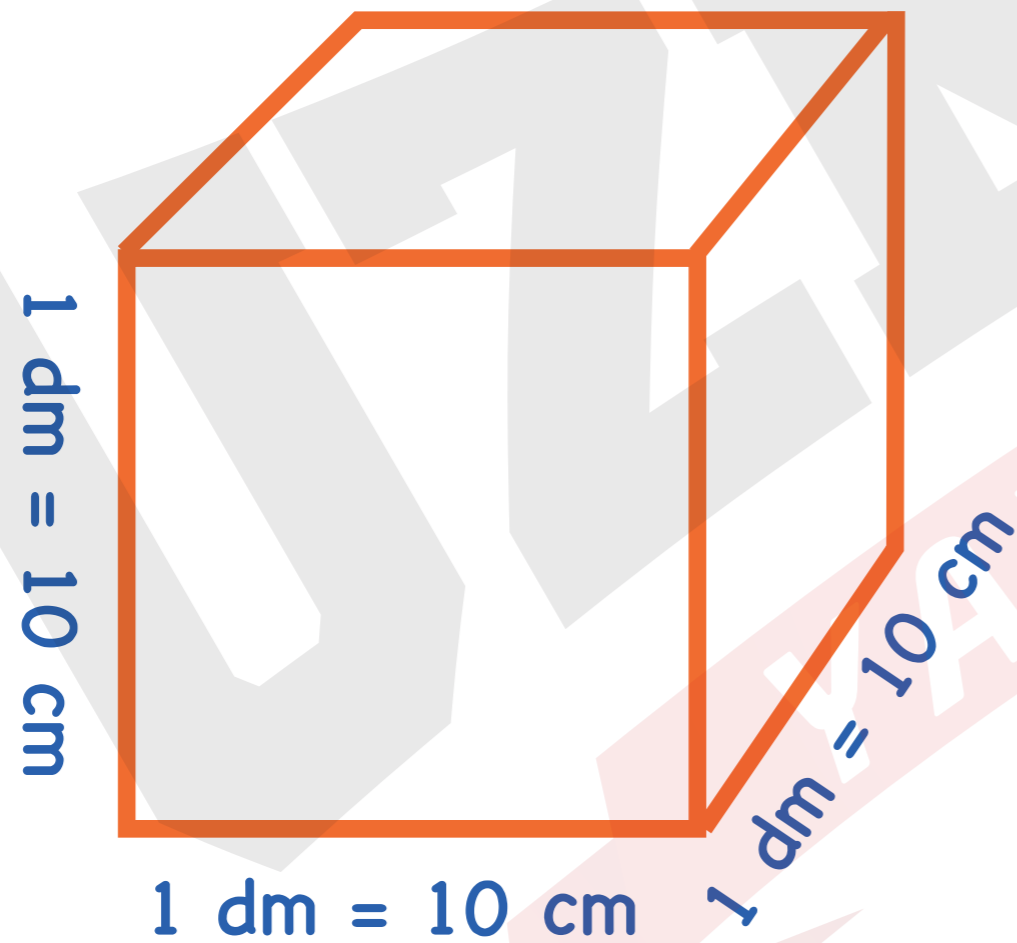


1 cm^3

→ $1 \text{ dm}^3 = 1 \text{ dm} \times 1 \text{ dm} \times 1 \text{ dm}$

→ $1 \text{ dm}^3 = 10 \text{ cm} \times 10 \text{ cm} \times 10 \text{ cm}$

→ $1 \text{ dm}^3 = 1000 \text{ cm}^3$



1 dm^3

Birim

Santimetreküp	cm^3	1 cm^3
Desimetreküp	dm^3	$1 \text{ dm}^3 = 1000 \text{ cm}^3 = 10^3 \text{ cm}^3$
Metreküp	m^3	$1 \text{ m}^3 = 1000 \text{ dm}^3$ $= 1\,000\,000 \text{ cm}^3 = 10^6 \text{ cm}^3$

→ Hacim birimleri 1000' er 1000' er büyür ya da küçülür.



Birim

Metreküp

m^3

$1 m^3$

Desimetreküp

dm^3

$1 dm^3 = 10^{-3} m^3$

Santimetreküp

cm^3

$1 cm^3 = 10^{-3} dm^3 = 10^{-6} m^3$



Örnek:

→ $0,4 \text{ m}^3 = 400 \text{ dm}^3$

→ $0,06 \text{ m}^3 = 60 \text{ dm}^3$

→ $20 \text{ dm}^3 = 20\,000 \text{ cm}^3$

→ $0,8 \text{ dm}^3 = 800 \text{ cm}^3$

m^3

dm^3

cm^3

1000 ile çarp



Örnek:

→ $500 \text{ cm}^3 = 0,5 \text{ dm}^3$

→ $6000 \text{ dm}^3 = 6 \text{ m}^3$

→ $7 \cdot 10^6 \text{ cm}^3 = 7 \text{ m}^3$

→ $4 \cdot 10^5 \text{ cm}^3 = 0,4 \text{ m}^3$

m^3

dm^3

cm^3

1000 ile böl

Örnek:

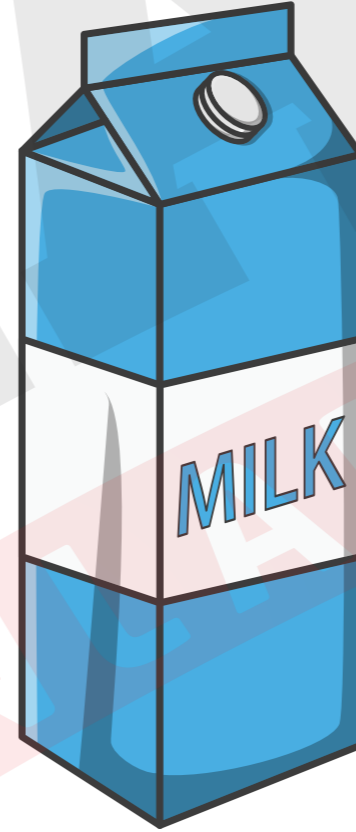
Litre

→ $1 \text{ dm}^3 = 1 \text{ L}$

→ $10 \text{ dm}^3 = 10 \text{ L}$

→ $0,2 \text{ L} = 0,2 \text{ dm}^3$

→ $5 \text{ L} = 5 \text{ dm}^3 = 5000 \text{ cm}^3$



1 L



1,5 L

Örnek:

Mililitre

→ 1 L = 1000 mL

→ 4 L = 4000 mL

→ 0,5 L = 500 mL

→ 250 mL = 0,25 L



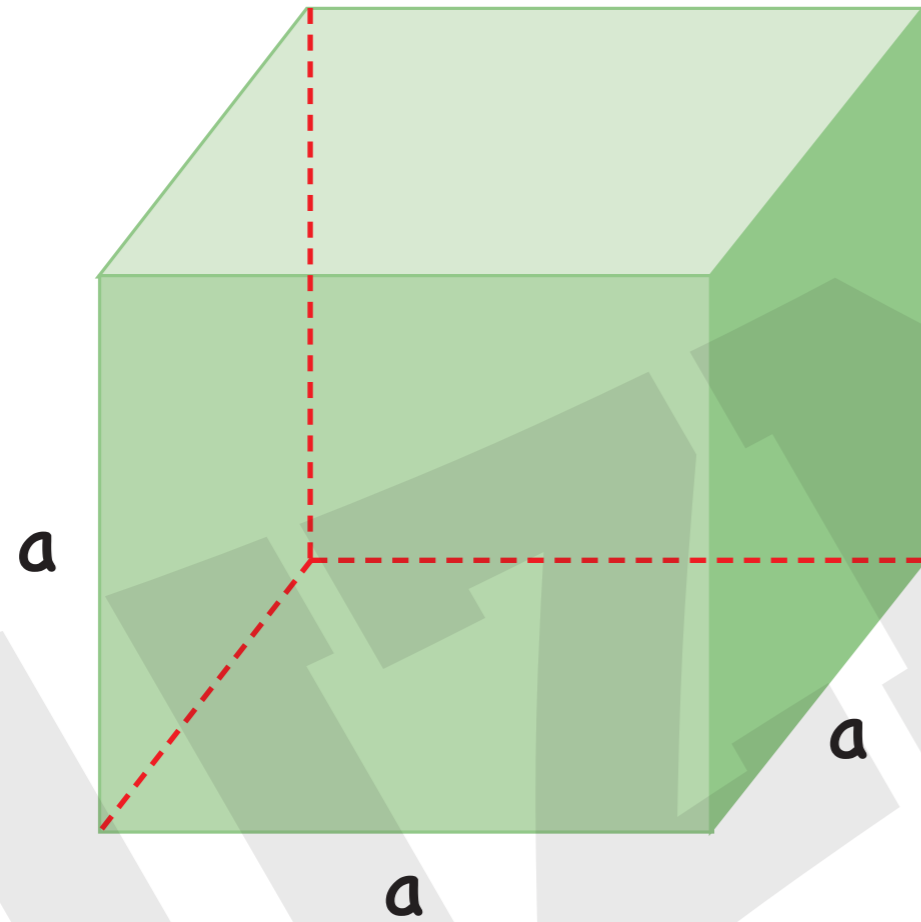
250 mL



330 mL



Küpün Hacmi:

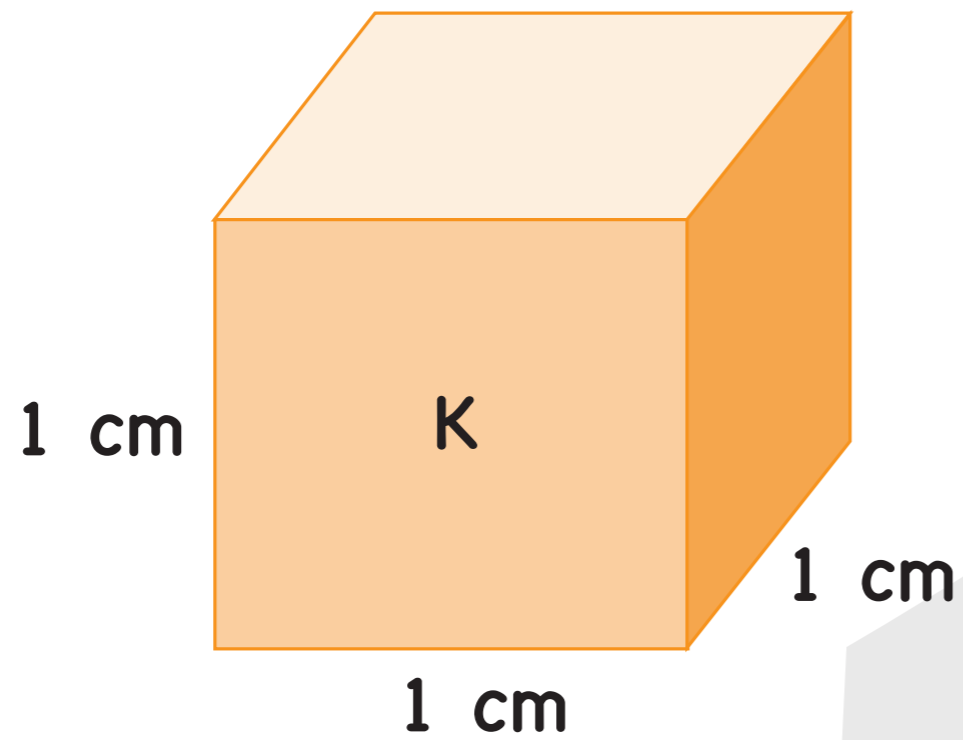


Hacim = Taban alanı . Yükseklik

$$V = a \cdot a \cdot a$$

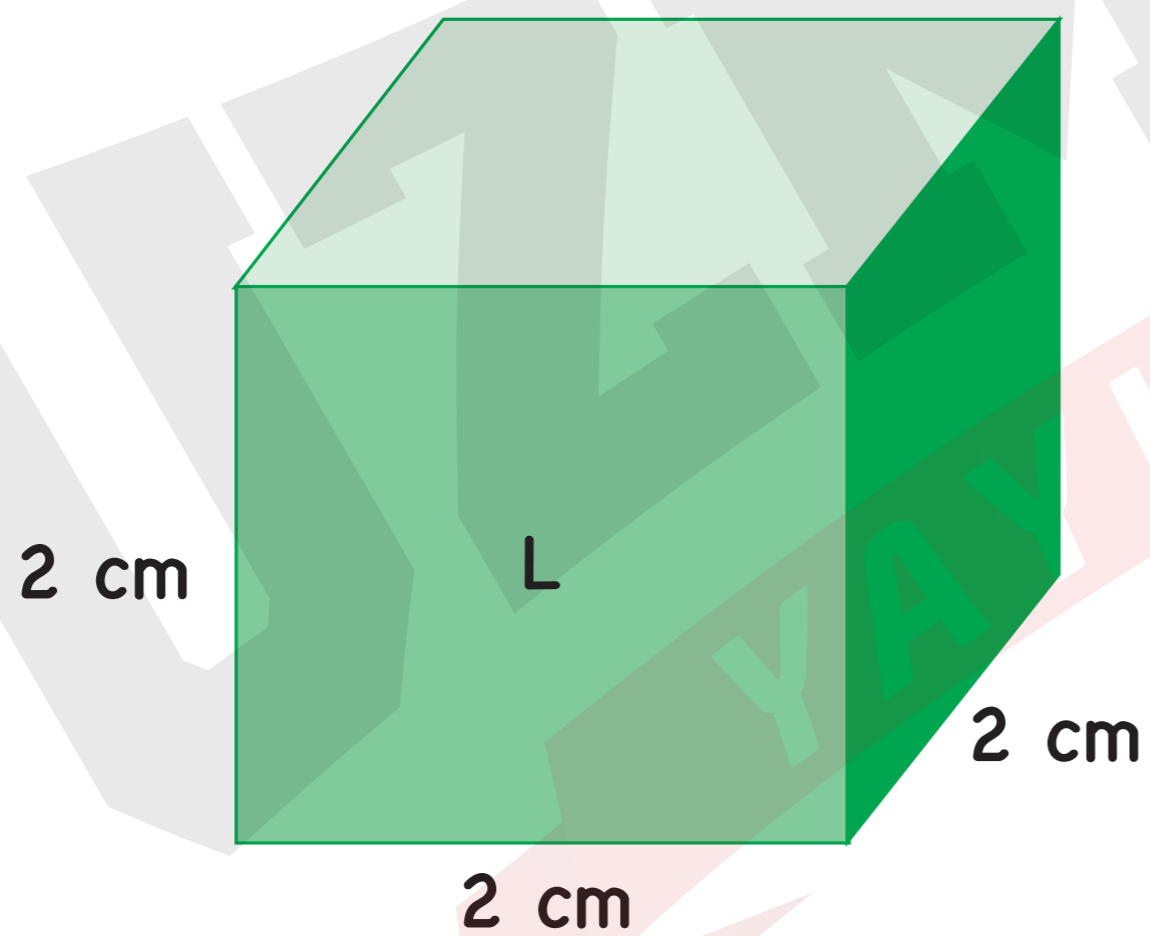
$$V = a^3$$





$$V = a^3$$

$$V_K = 1^3 = 1 \cdot 1 \cdot 1 = 1 \text{ cm}^3$$

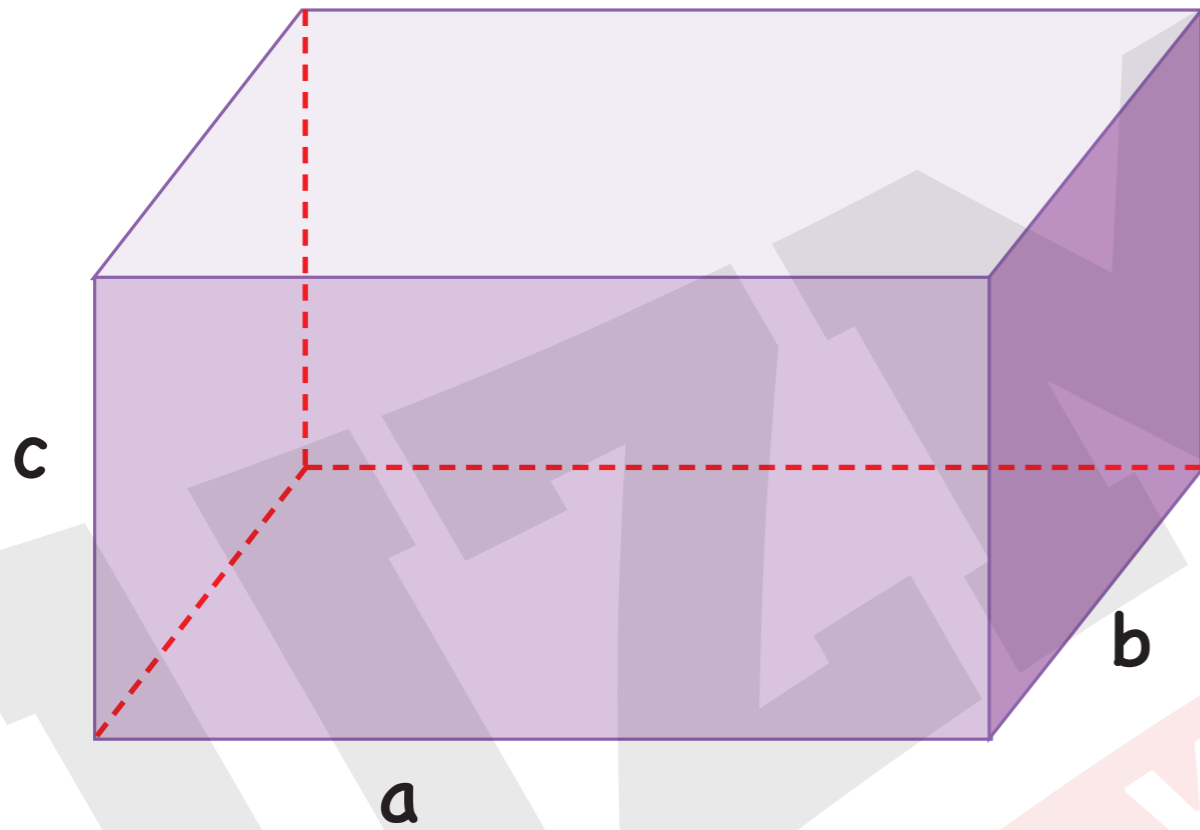


$$V_L = 2^3 = 2 \cdot 2 \cdot 2 = 8 \text{ cm}^3$$

$$a \rightarrow 2a$$

$$V \rightarrow 8V$$

Dikdörtgenler Prizmasının Hacmi:



Hacim = Taban alanı . Yükseklik

$$V = a \cdot b \cdot c$$

$$V = abc$$

Silindirin Hacmi:



Hacim = Taban alanı . Yükseklik

$$V = \pi r^2 \cdot h$$



$$V_X = \pi r^2 \cdot h$$

$$r \rightarrow 2r$$

$$S \rightarrow 4S$$

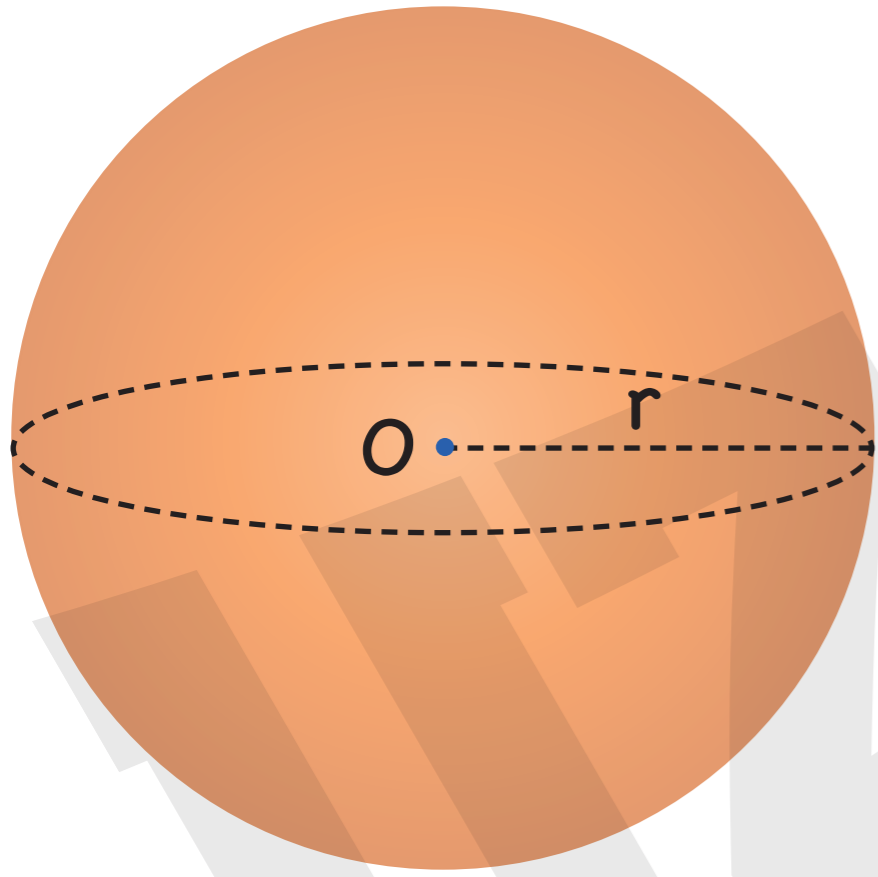
$$V \rightarrow 4V$$



$$V_Y = \pi(2r)^2 \cdot h$$

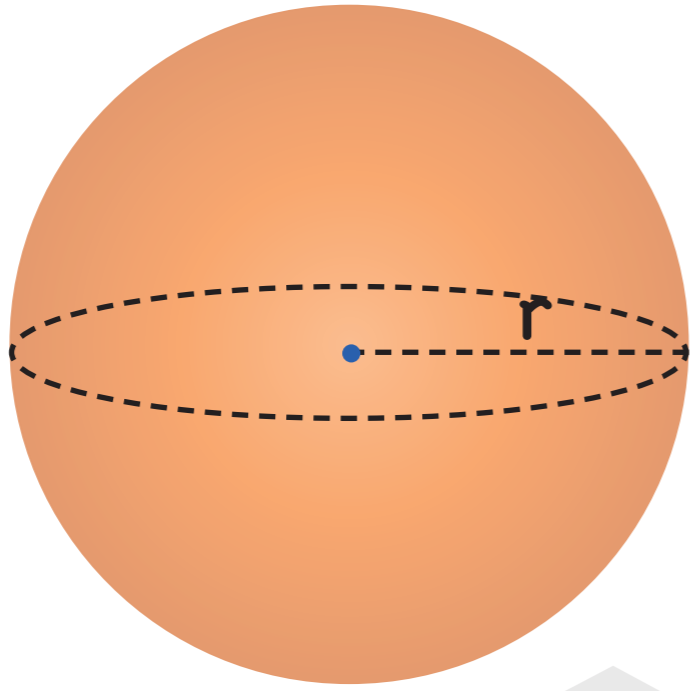
$$V_Y = 4 \pi r^2 \cdot h$$

Kürenin Hacmi:



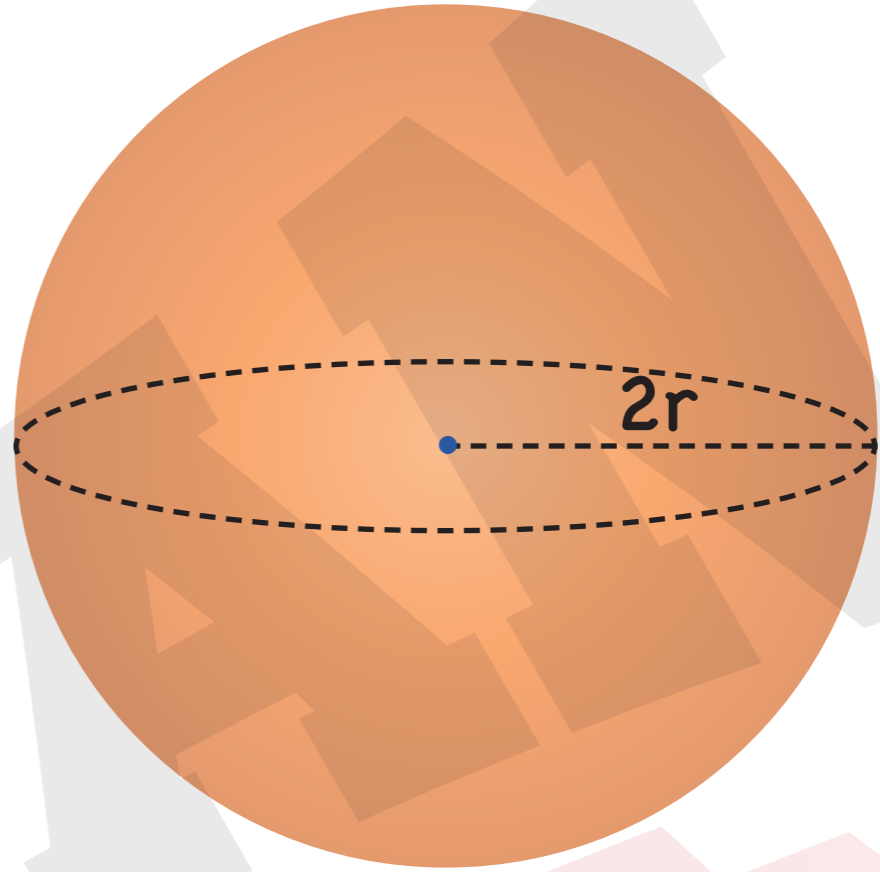
$$V = \frac{4}{3} \pi r^3$$





X

$$V_X = \frac{4}{3} \pi r^3$$



Y

$$V_Y = \frac{4}{3} \pi (2r)^3$$

$$V_Y = 8 \frac{4}{3} \pi r^3$$

$$r \rightarrow 2r$$

$$V \rightarrow 8V$$

