7.3CH Volume of a Cylinder

Go over # 24 on page 261

A rectangular tank, 40 m long by 30 m wide, is filled with 960 m^3 of water.

a) Determine the depth of water.

$40 \times 30 \times d = 960$

$d = \frac{960}{40 \times 30}$

$d = 0.8\ m$ or $80\ cm$

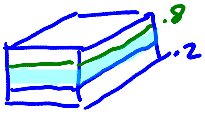
If the water drains out at a rate of 60 m^3/h, how much water is left after 2.5 h? What is the new depth of water

$\frac{60\ m^3}{h} \times 2.5\ h = 150\ m^3$ drained

So... $960 - 150 = 810\ m^3$

new depth: $\frac{810}{40 \times 30} = 0.675\ m$

Later, the depth of the water is 0.2 m. For how long has the tank been draining?



} so decrease of 0.6m

Volume decrease is $40 \times 30 \times 0.6 = 720\ m^3$

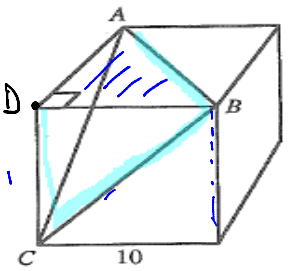
$\frac{720\ m^3}{60\ m^3/h} = 720\ m^3 \times \frac{1\ h}{60\ m^3} = 12\ h$

1 ml = 1 cm^3

1000 ml = 1 liter = 1000 cm^3

Challenge Question:

A cube having an edge length of 10 is sliced into two sections by a cut in the plane ABC, as shown in the diagram. Find the volume of the smaller section.



$\Delta ABD = \frac{10 \times 10}{2} = 50$

prism $50 \times 10 = 500$

∴ pyramid $500 \times \frac{1}{3} = 166\frac{2}{3}$ cubic units

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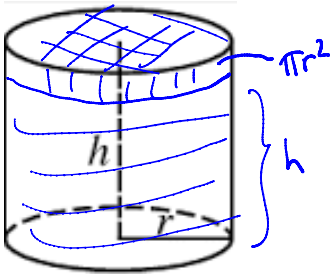
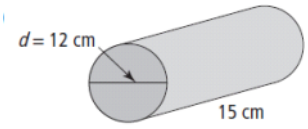
Volume of a Cylinder

Formula: $V = \pi r^2 h$



1. Calculate the volume:



$V = \pi(6)^2(15)$
$= \pi(36)(15)$
$= 540\pi \text{ cm}^3$ ✓
$\approx 1695.6 \text{ cm}^3$

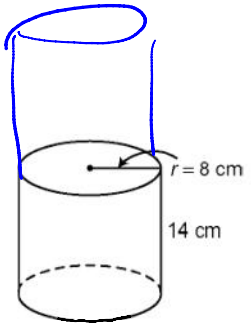
pipe → culvert

2. How much soil will you need to fill the semi-circular planter? Express your answer to the closest thousandth.

$V = \frac{\pi r^2 h}{2} =$

$SA = \frac{2\pi r^2 + 2\pi rh}{2} + (0.9 \times 0.3)$

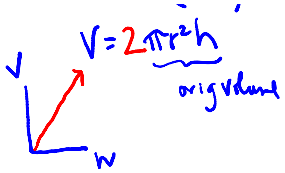
3. Avery thinks that if you want to double the volume of this cylinder, you must double the height of it. Monica believes that to double the volume, you must double the radius. Prove who is right.

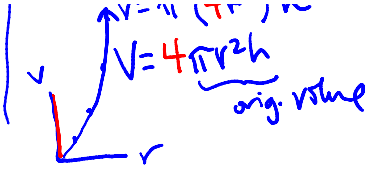


Avery
$V = \pi r^2 h$
$V = \pi r^2 (2h)$
$V = 2\pi r^2 h$
orig volume

Monica
$V = \pi r^2 h$
$V = \pi (2r)^2 h$
$V = \pi (4r^2) h$
$V = 4\pi r^2 h$
orig. volume

A) Avery ✓
B) Monica
C) Both
D) Neither.





C) Both
D) Neither.

What happens to the volume when you triple, quadruple..... multiply the radius by factor n?

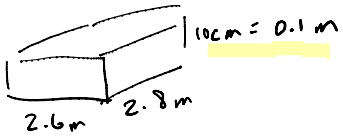
$n^2 x$ $9x$ $4^2 = 16x$

Assignment p265 #4b,6b,8,9,11-18

p258 homework check.

9c) $\left(\frac{260 \times 140}{2}\right) \times 400 = 7280000 \times \frac{3}{4} = 5460000\,mm^3$

13.



Needs $2.6 \times 2.8 \times 0.1 = 0.728m^3$

$0.728m^3 - 0.5m^3 = 0.228m^3$ more needed

17. $10 \times 12 \times 3 = \frac{360m^3}{9m^3} = 40$ trips.

20. $l : w : h$

$6 : 3 : 2$ $\times 2.5$

$15 : 7.5 : 5$

$V = 15 \times 7.5 \times 5 = 562.5cm^3$