



The National
Orthodox School
Shmaisani

key answer worksheet 2

Name:

Worksheet(2) volume of prisms and cylinders

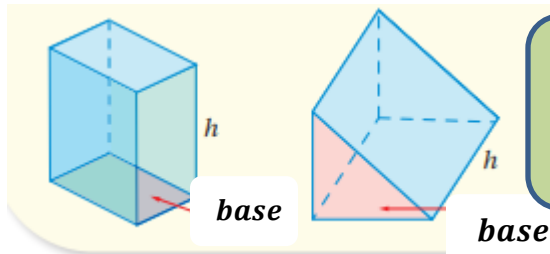
Grade:8(A, B)

Subject : Math (Unit (7):Mensuration of planes and solids)

Date :

Objective: Find the volume of prisms and cylinders

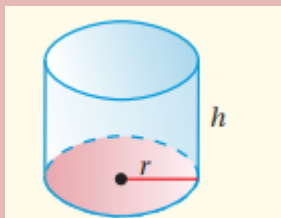
*volume of the prism = area of the **base** × height(h)*



*= (area of **cross – section**) × height(h)*

volume of the cylinder = area of the base × height(h)

*= area of **cross – section** × height(h)*



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

Accredited by



Cambridge Assessment
International Education
Cambridge International School

edexcel

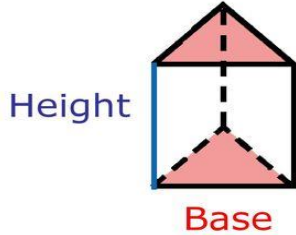
CIS
COUNCIL OF
INTERNATIONAL
SCHOOLS



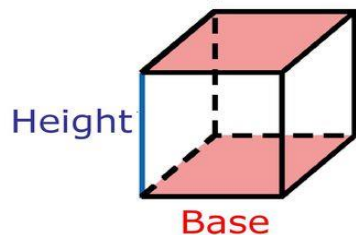
معتمدة من

8-5 Volume of Prisms and Cylinders

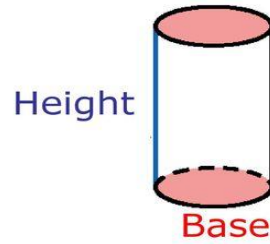
Triangular prism



Rectangular prism



Cylinder



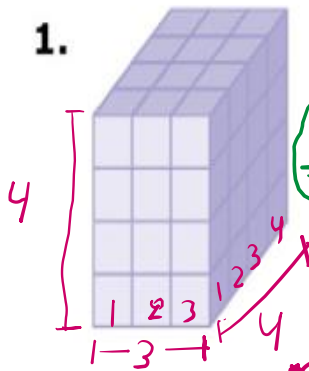
Course 3

Copyright © by Holt, Rinehart and Winston. All Rights Reserved.

Exercise 1:

Find how many cubes the prism holds. Then give the prisms volume.

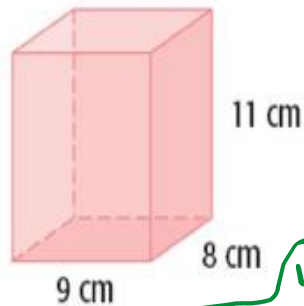
1.



$$\begin{aligned} \text{Volume} &= 3 \times 4 \times 4 \\ &= 12 \times 4 \\ &= 48 \end{aligned}$$

48 cubic units

2.

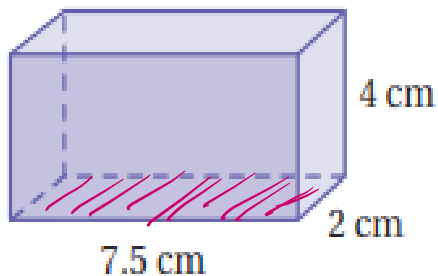


$$\begin{aligned} \text{Volume} &= 9 \times 8 \times 11 \\ &= 72 \times 11 \\ &= 792 \end{aligned}$$

792 cm³

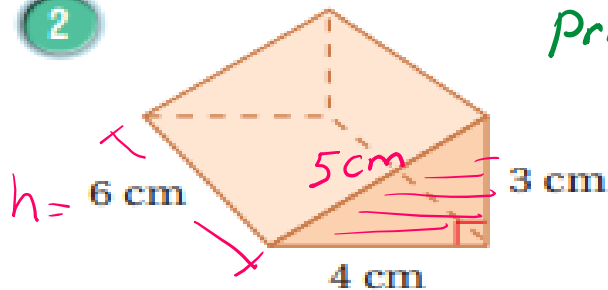
Exercise 2: find the volume of the following solids:

1



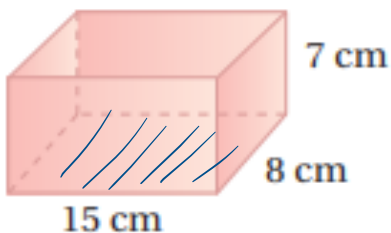
$$\begin{aligned}
 \text{Volume}_{\text{prism}} &= A_{\text{base}} * h \\
 &= (7.5 * 2) * 4 \\
 &= 15 * 4 \\
 &= \boxed{60 \text{ cm}^3}
 \end{aligned}$$

2



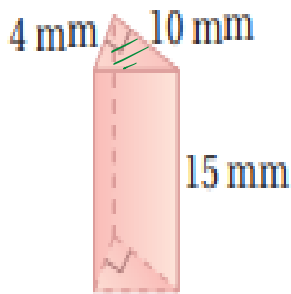
$$\begin{aligned}
 \text{Volume}_{\text{Prism}} &= A_{\text{base}} * h \\
 &= \left(\frac{1}{2} * 4 * 3\right) * 6 \\
 &= (2 * 3) * 6 \\
 &= 6 * 6 \\
 &= \boxed{36 \text{ cm}^3}
 \end{aligned}$$

3



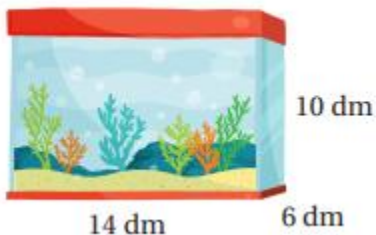
$$\begin{aligned}
 \text{Volume}_{\text{Prism}} &= A_{\text{base}} * h \\
 &= (15 * 8) * 7 \\
 &= 120 * 7 \\
 &= \boxed{840 \text{ cm}^3}
 \end{aligned}$$

4



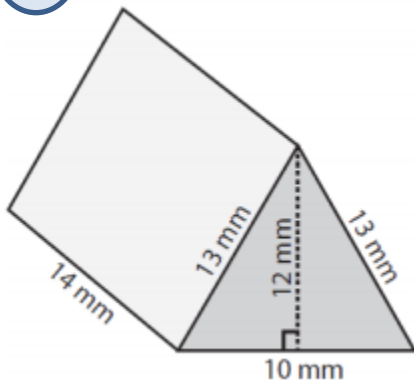
$$\begin{aligned}
 \text{Volume}_{\text{Prism}} &= A_{\text{base}} * h \\
 &= \left(\frac{1}{2} * 4 * 10\right) * 15 \\
 &= 20 * 15 \\
 &= \boxed{300 \text{ cm}^3}
 \end{aligned}$$

5



$$\begin{aligned}
 \text{Volume}_{\text{Prism}} &= A_{\text{base}} * h \\
 &= 14 * 6 * 10 \\
 &= \boxed{840 \text{ cm}^3}
 \end{aligned}$$

6

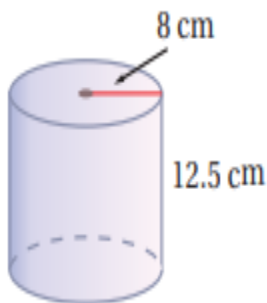


$$\begin{aligned}
 \text{Volume}_{\text{Prism}} &= A_{\text{base}} * h \\
 &= \left(\frac{1}{2} * 10 * 12\right) * 14 \\
 &= (5 * 12) * 14 \\
 &= 60 * 14 \\
 &= \boxed{840 \text{ cm}^3}
 \end{aligned}$$

Remember: $A_{\text{circle}} \approx \pi r^2$

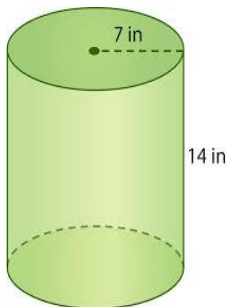
$$\pi \approx \frac{22}{7} \\ \approx 3.14$$

7



$$\begin{aligned} \text{Volume} &= A_{\text{base}} * h \\ &\text{(in terms of } \pi \text{)} \\ &= (\pi r^2) * h \\ &\approx \pi (8)^2 * 12.5 \\ &\approx \pi * 64 * 12.5 \\ &\approx \boxed{800 \pi} \text{ cm}^3 \end{aligned}$$

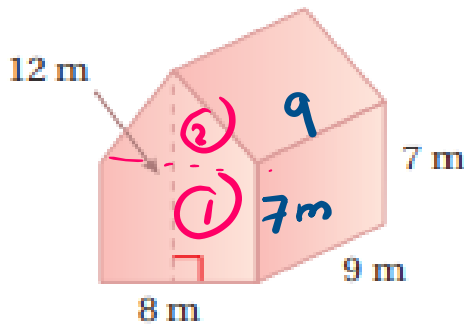
8



$$\begin{aligned} \text{Volume} &= A_{\text{base}} * h \\ &\text{(in terms of } \pi \text{)} \\ &\approx (\pi r^2) * h \\ &\approx \pi (7)^2 * 14 \\ &\approx \pi (49) * 14 \\ &\approx \boxed{686 \pi} \text{ in}^3 \end{aligned}$$

9

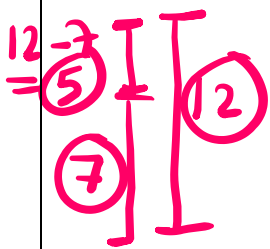
$$\text{Volume Total} = \text{Volume Cuboid} + \text{Volume triangular Prism}$$



$$= (8 \times 9 \times 7) + \left(\frac{1}{2} \times 8 \times 5\right) \times 9$$

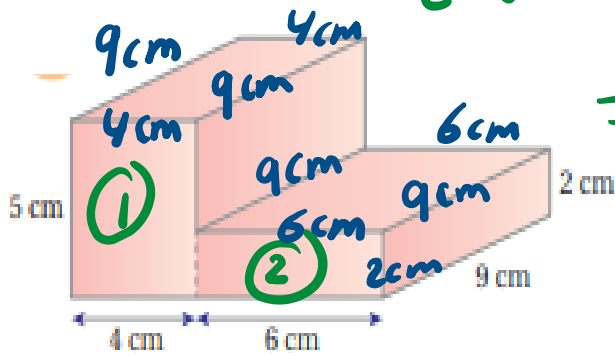
$$= 504 + 180$$

$$= \boxed{684 \text{ m}^3}$$



10

$$\text{Volume Total} = \text{Volume Cuboid (1)} + \text{Volume Cuboid (2)}$$



$$= (4 \times 5 \times 9) + (6 \times 2 \times 9)$$

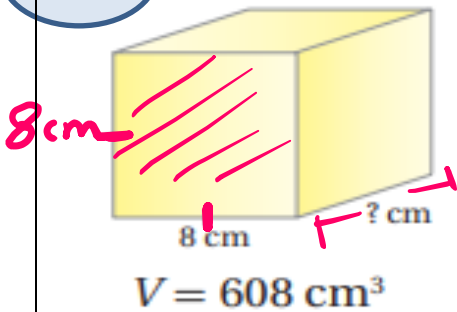
$$= (20 \times 9) + (12 \times 9)$$

$$= 180 + 108$$

$$= \boxed{288 \text{ cm}^3}$$

Exercise (3): find the missing dimension in each of the following prisms:

1



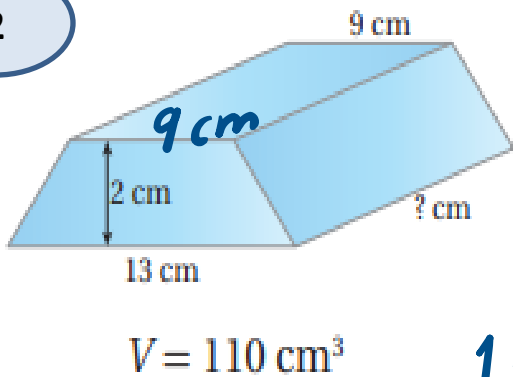
$$\text{Volume} = A_{\text{base}} * h$$

$$608 = (8 * 8) * h$$

$$608 = 64 * h \quad \text{equation}$$

$$\frac{608}{64} = \frac{64 * h}{64} \Rightarrow h = 9.5 \text{ cm}$$

2



$$\text{Volume} = A_{\text{base}} * h$$

$$110 = \left(\frac{1}{2} * (13 + 9) * 2 \right) * h$$

$$110 = \left(\frac{1}{2} * \underline{22} * \underline{2} \right) * h$$

$$110 = 22 h \quad \text{equation}$$

$$\frac{110}{22} = \frac{22 h}{22} \Rightarrow h = 5 \text{ cm}$$

Exercise (4): calculate the missing values in the table for each of the four prisms below :

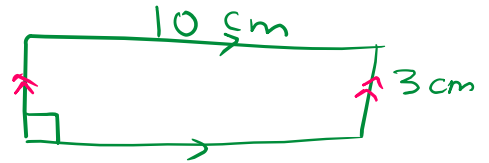
<i>Area of cross – section</i> (cm^2)	<i>* Height</i> (cm)	<i>=</i> Volume of prisms (cm^3)
12	3	36
78	9	702 $\begin{array}{r} 9 \\ 78 \overline{) 702} \\ \underline{702} \\ 00 \end{array}$
12	1.2	14.4 $\begin{array}{r} 1.2 \\ 12 \overline{) 14.4} \\ \underline{12} \\ 24 \\ \underline{24} \\ 0 \end{array}$
14	5.6 $\begin{array}{r} 14 \\ 56 \overline{) 784} \\ \underline{56} \\ 224 \\ \underline{224} \\ 0 \end{array}$	78.4 $\begin{array}{r} 78.4 \times 10 = \frac{784}{56} \\ \hline (5.6) \times 10 \end{array}$

Teacher: Wisam Al – mashn

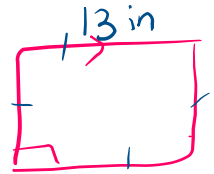
Revision

① find the area of the following shapes:

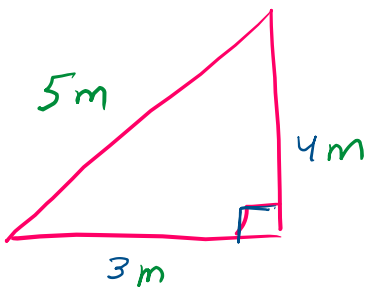
a) $A = L \times w$
 $= 10 \times 3$
 $= (30) \text{ cm}^2$



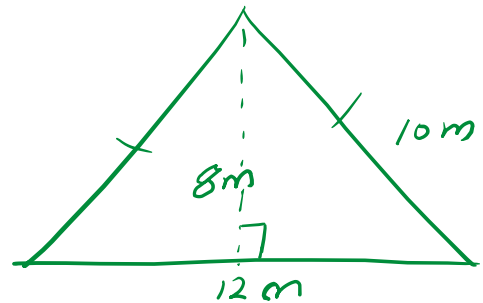
b) $A = s^2$
 $= (13)^2$
 $= 13 \times 13$
 $= \boxed{169} \text{ in}^2$



③

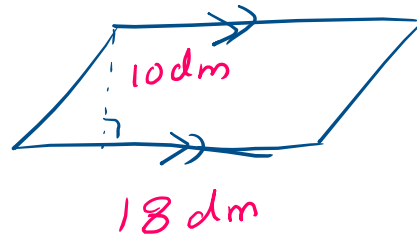


$$A = \frac{1}{2}bh$$
$$= \frac{1}{2} \times 3 \times 4$$
$$= (6) \text{ m}^2$$



$$A = \frac{1}{2}bh$$
$$= \frac{1}{2} \times 12 \times 8$$
$$= (48) \text{ m}^2$$

$$\begin{aligned} \text{d) } A &= b \times h \\ &= 18 \times 10 \\ &= 180 \text{ dm}^2 \end{aligned}$$

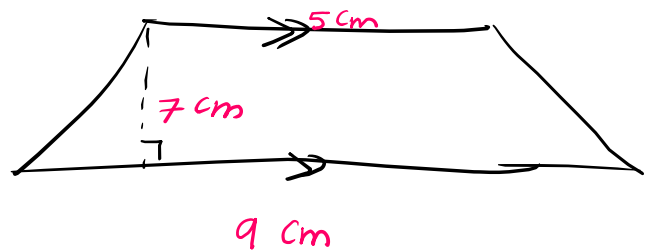


$$\text{e) } A = \frac{1}{2} \times (b_1 + b_2) \times h$$

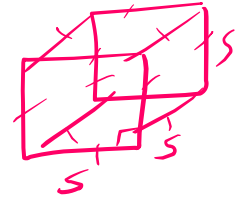
$$= \frac{1}{2} \times (9 + 5) \times 7$$

$$= \frac{1}{2} \times 14 \times 7$$

$$= (49) \text{ cm}^2$$



$$\text{Volume}_{\text{prism}} = A_{\text{base}} \times h_{\text{prism}}$$



$$\Rightarrow V_{\text{cube}} = s^2 \times s$$

$$V_{\text{cube}} = s^3$$

حجم المكعب = طول الضلع³

2) If the volume of a cube is 0.064 cm^3 , then its side length is:

a) 0.8 cm

c) 0.08 cm

b) 0.4 cm

d) 0.04 cm

$$V_{\text{cube}} = s^3$$

$${}^3\sqrt{0.064} = {}^3\sqrt{s^3}$$

$$s = \frac{{}^3\sqrt{64}}{{}^3\sqrt{1000}} \text{ cm}$$

$$= \frac{\sqrt[3]{64}}{\sqrt[3]{1000}}$$

$$= \frac{4}{10} = \boxed{0.4} \text{ cm}$$

b

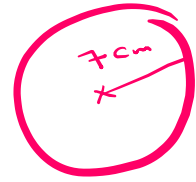
3

find :

a) its circumference

(use $\pi \approx \frac{22}{7}$)

circle



حل

$$C = 2\pi r$$

$$= 2 \times \frac{22}{7} \times 7$$

$$= (44) \text{ cm}$$

b) its circumference (in terms of π)

$$C = 2\pi r$$

$$= 2\pi (7)$$

$$= (14\pi) \text{ cm}$$

c) its Area (use $\pi \approx \frac{22}{7}$)

$$A = \pi r^2$$

$$= \frac{22}{7} \times 7 \times 7$$

$$= (154) \text{ cm}^2$$

d) its Area (in terms of π)

$$A = \pi r^2$$

$$= \pi (7)^2$$

$$= \boxed{49\pi} \text{ cm}^2$$