WARMUP #1

- Write the formulas for the area of a trapezoid, triangle, rhombus, square, parallelogram, rectangle, and circle.

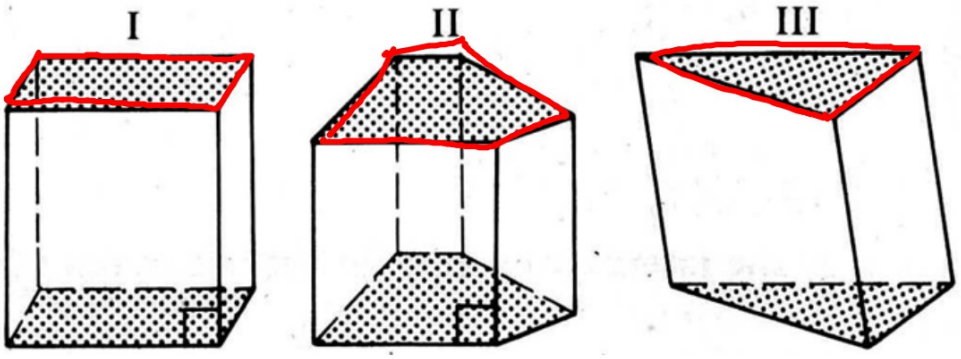
CHAPTER 12:
AREAS AND VOLUMES OF SOLIDS

SECTION 12.1:
PRISMS

Standards:

PRISMS

Base: **Shaded faces. Bases are congruent polygons in parallel planes.**



Rectangular Prism

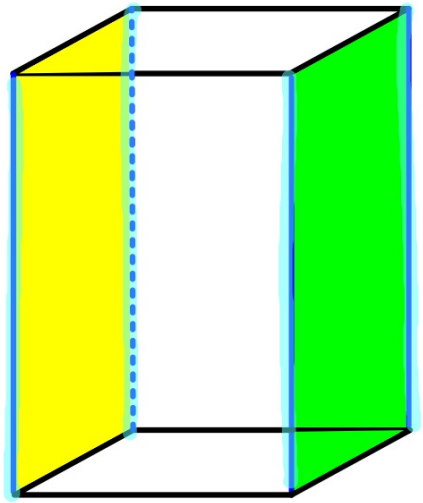
Pentagonal Prism

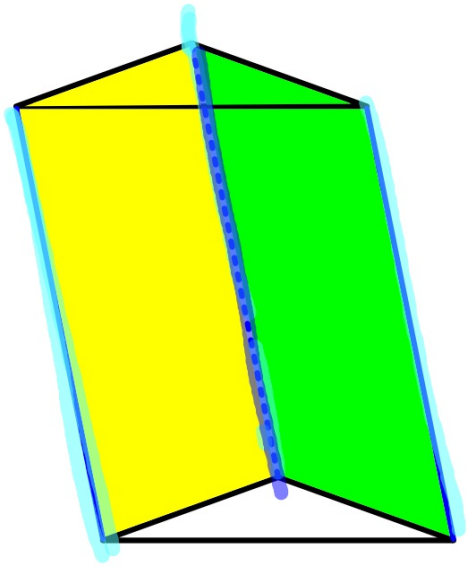
Triangular Prism

PRISMS

Lateral Faces & Lateral Edges: Faces that are not bases.

They are parallelograms that intersect in || segments (lateral edges).



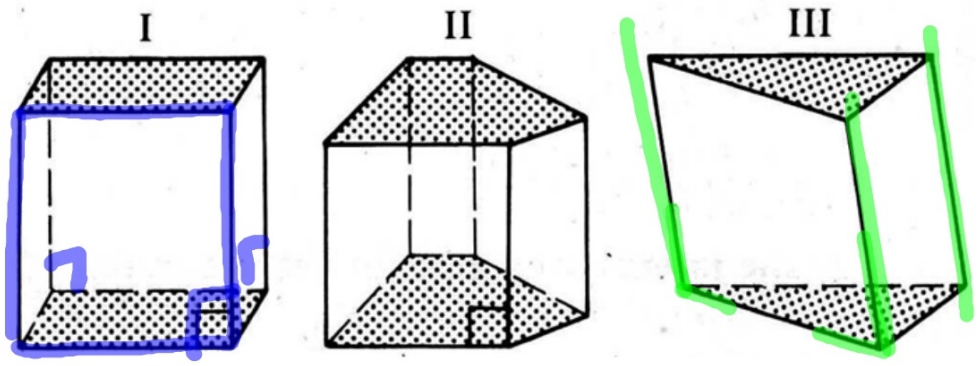


Lateral edges are the blue segments.

PRISMS

Right Prism: when the lateral faces are rectangles (I and II)

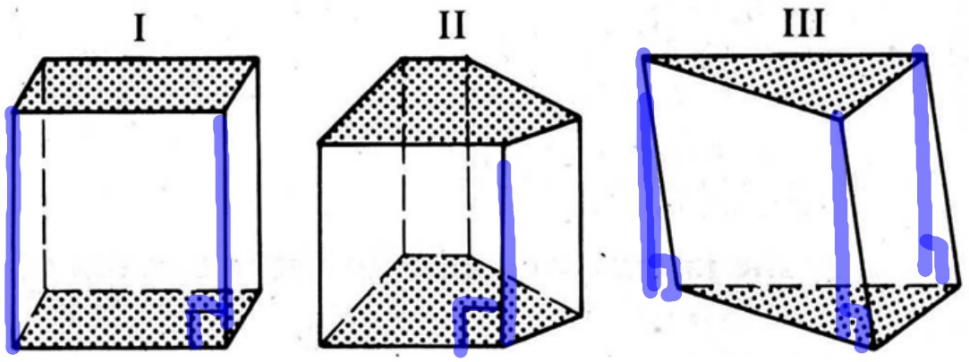
Oblique Prism: lateral faces are not rectangles (III)



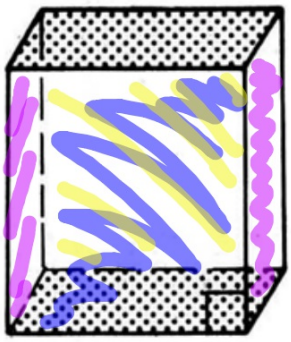
PRISMS

Altitude: a segment joining the two base planes and is ⊥ to both. In a right prism lateral edge = altitude

Height: the length of an altitude

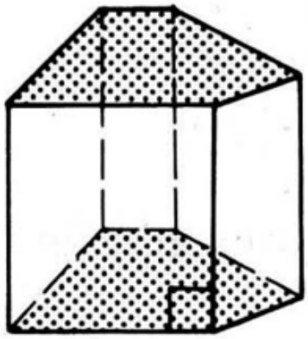


I



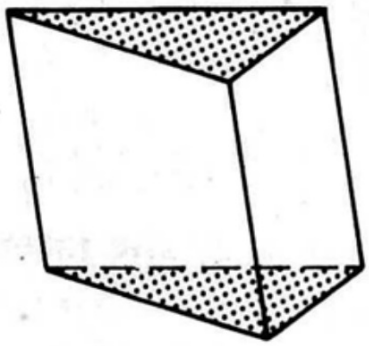
right rectangular prism

II

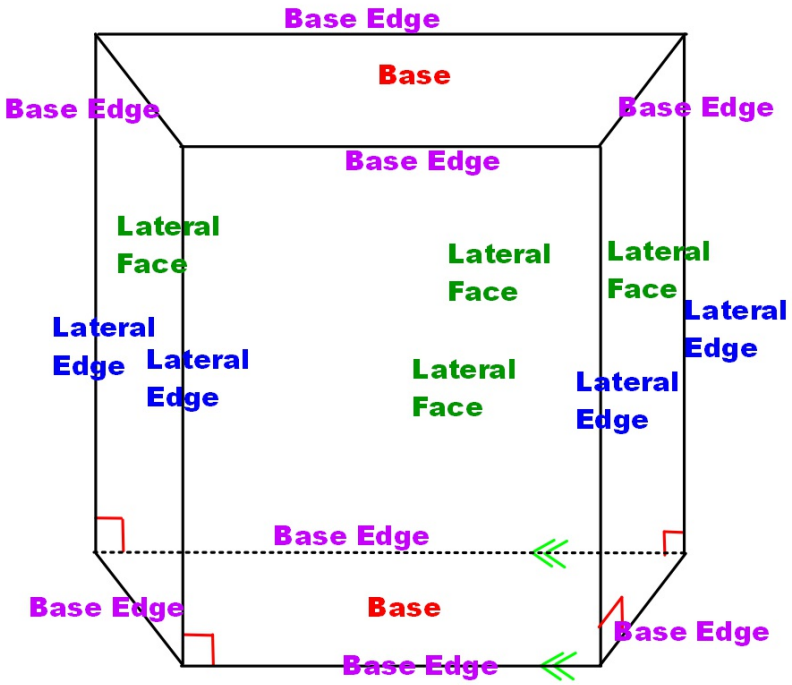


right pentagonal prism

III



oblique triangular prism



This is a trap h. prism

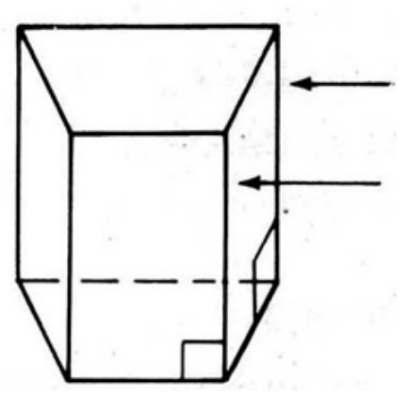
Grab, drag, and drop to categorize and label each part.

Base Edge

Lateral Edge

Base

Lateral Face



Label.....

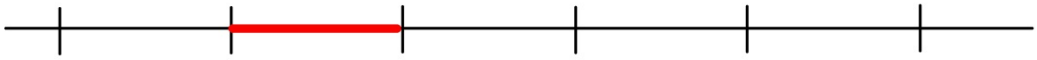
Lateral Edge / Height

Base Edge

Lateral Face

Base

In 1-Dimension, it is measured in units.

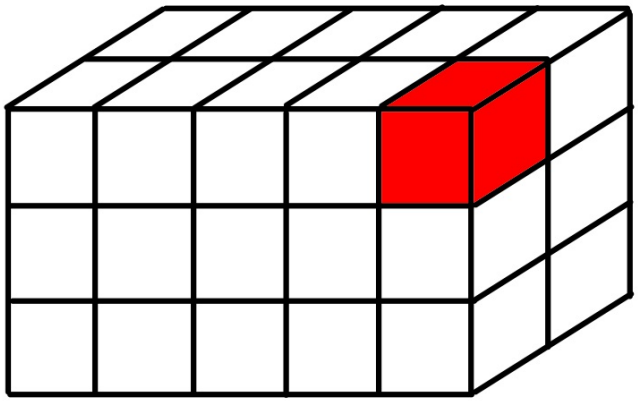


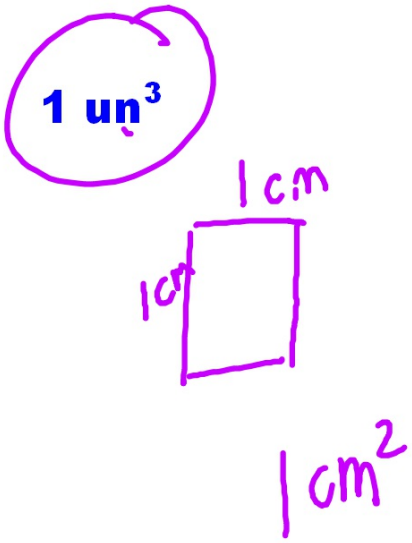
1 unit

In 1-Dimension, it is measured in units.

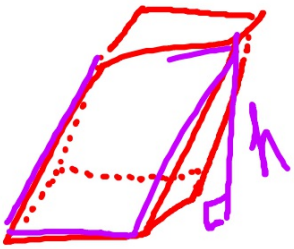
1 unit

In 3-Dimensions it is measured in units CUBED. It is called the volume.



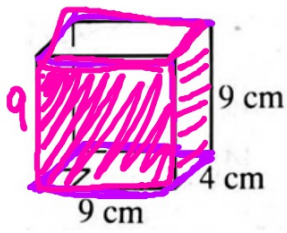


LATERAL AREA	TOTAL AREA	VOLUME
sum of the areas of the lateral faces. LA of a right prism = perimeter times the height of the prism.	sum of the areas of ALL faces. TA of a right prism = LA+ areas of both bases	the volume of a right prism = the area of base times the height of the prism.
$LA = p \cdot h$	$TA = LA + 2B$	$V = B \cdot h$



1-3: Find (a) the lateral area, (b) the total area, and (c) the volume of each right prism.

1)



$P = (9+4+9+4) \cdot 9$

$81 + 81 + 36 + 36$

a) **234 cm^2**

$+72$ (two bases)

b) **306 cm^2**

Base area $= 9 \cdot 4 = 36$

$2(36) = 72$

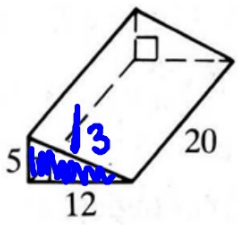
c) **324 cm^3**

$36 \cdot 9$

Base area · height

1-3: Find (a) the lateral area, (b) the total area, and (c) the volume of each right prism.

2)



a) ✦ 600

b) ✦ 600

c) ✦ 1200

$LA = Ph$

$30 \cdot 20 = 600$

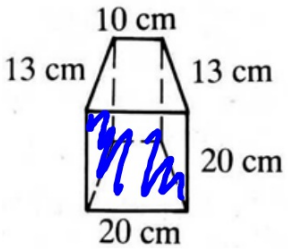
$TA = LA + 2B$

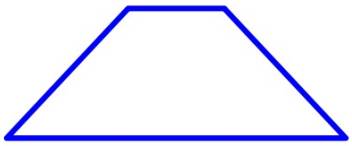
$600 + 60$

$V = (60 \cdot 20)h = 1200$

1-3: Find (a) the lateral area, (b) the total area, and (c) the volume of each right prism.

3)



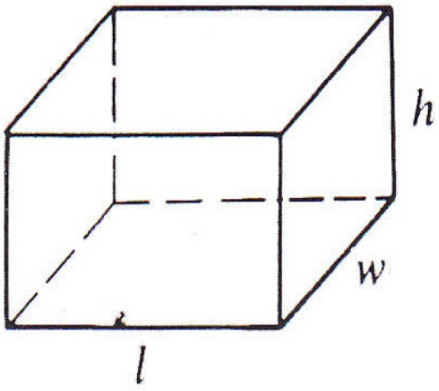


$LA = Bh$

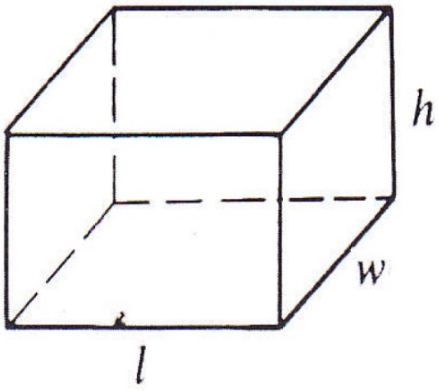
a)

b)

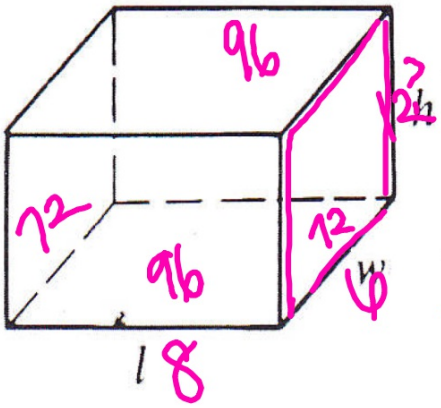
c)



l	**25**
w	**20**
h	**10**
LA	
TA	
V	



l	**15**
✦ w	
h	**4**
LA	**216**
✦ TA	
✦ V	



l	**8**
w	**6**
✦ h	**12**
✦ LA	
✦ TA	
V	**576**

$V = l \cdot w \cdot h$

$\frac{576}{48} = \frac{48h}{48}$

48
48

A cube has an edge of 3 cm.

T.A. =

Vol. =

9 x 6

The volume of a cube is 125 in^3 . Find its area.

$5 \cdot 5 \cdot 5$

25

$\times 6$

150

The area of a cube is $\frac{96}{6}$ in^2. Find its volume.

Area side $\sqrt{16}$

side $4 \times 4 \times 4 = 64$

HOMEWORK

$x^3 = 27$

Assignment #12.1

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3·3·3

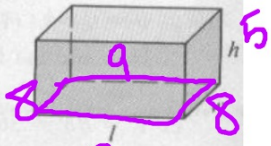
THURSDAY - QUIZ 12.1-12.2

Exercises 1–6 refer to rectangular solids with dimensions l, w, and h. Complete the table.

A

	1.	2.	3.	4.	5.	6.
l	6	50	6	9	9	$5x$
w	4	30	3	8	?	$4x$
h	2	15	3	5	2	$3x$
L.A.	?	?	54	?	60	?
T.A.	?	?	90	?	?	?
V	?	?	54	360	?	?

P = 18.3



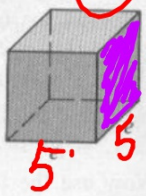
16.6

$LA = P \cdot H$

Exercises 7–12 refer to cubes with edges of length e. Complete the table.

	7.	8.	9.	10.	11.	12.
e	3	e	10	4	5	$2x$
T.A.	54	?	600	96	150	$24x^2$
V	27	?	1000	64	125	$8x^3$

6 · 4x²



13. Find the lateral area of a right pentagonal prism with height 13 and base edges 3.2, 5.8, 6.9, 4.7, and 9.4.

14. A right triangular prism has lateral area 120 cm^2. If the base edges are 4 cm, 5 cm, and 6 cm long, find the height of the prism.

Facts about the base of a right prism and the height of the prism are given. Sketch each prism and find its lateral area, total area, and volume.

17. Equilateral triangle with side 8; $h = 10$

18. Triangle with sides 9, 12, 15; $h = 10$

19. Isosceles triangle with sides 13, 13, 10; $h = 7$

20. Isosceles trapezoid with bases 10 and 4 and legs 5; $h = 20$

21. Rhombus with diagonals 6 and 8; $h = 9$

22. Regular hexagon with side 8; $h = 12$

HW 12.1
P478 #1-14, 17-22

$V = lwh$

10 · 10 · 10 = 1,000

area 1 side = 9

6 · 9 = 54

24