VOLUME

A DEFINITION

A.1 FINDING VOLUME OF A SHAPE

Ex 1: What is the volume of the red figure?





The volume is 8 cubic units.

Ex 3: What is the volume of the red figure?



Answer: To find the volume, we count the number of unit cubes inside the shape.



The volume is 7 cubic units.

Ex 4: What is the volume of the red figure?



Answer: To find the volume, we count the number of unit cubes inside the shape.



The volume is 6 cubic units.

Ex 2: What is the volume of the red figure?



 ${\it Answer:}$ To find the volume, we count the number of unit cubes inside the shape.

9 cubic units

12 cubic units

Answer: To find the volume, we count the number of unit cubes inside the shape.



The volume is 9 cubic units.

A.2 FINDING VOLUME OF A RECTANGULAR CUBOID

Ex 5: What is the volume of the red figure?



Answer: To find the volume, we count the number of unit cubes inside the shape.



The volume is 8 cubic units.

Ex 6: What is the volume of the red figure?



 ${\it Answer:}$ To find the volume, we count the number of unit cubes inside the shape.



The volume is 12 cubic units.

Ex 7: What is the volume of the red figure?





Answer: To find the volume, we count the number of unit cubes inside the shape.



The volume is 12 cubic units.

Ex 8: What is the volume of the red figure?





Answer: To find the volume, we count the number of unit cubes inside the shape.



The volume is 24 cubic units.

B UNITS OF VOLUME

B.1 CHOOSING UNITS FOR VOLUME

MCQ 9: What unit will be used to measure the volume of your bedroom?

Choose 1 answer:

 $\hfill\square$ Cubic centimeters

 $\boxtimes~{\rm Cubic~meters}$

Answer: Cubic meters will be used to measure the volume of your bedroom because it's a larger unit, perfect for measuring bigger spaces like a room.

MCQ 10: What unit will be used to measure the volume of a small toy block? Choose 1 answer:

- \boxtimes Cubic centimeters
- $\Box\,$ Cubic meters

Answer: Cubic centimeters will be used to measure the volume of a small toy block because it's a smaller unit, perfect for measuring smaller objects like a toy block.

MCQ 11: What unit will be used to measure the volume of a bottle of milk? Choose 1 answer:

- \boxtimes Cubic centimeters
- \Box Cubic meters

Answer: Cubic centimeters will be used to measure the volume of a bottle of milk because it's a smaller unit, perfect for measuring smaller objects like a bottle of milk.

MCQ 12: What unit will be used to measure the volume of a swimming pool? Choose 1 answer:

- \Box Cubic centimeters
- \boxtimes Cubic meters

Answer: Cubic meters will be used to measure the volume of a swimming pool because it's a larger unit, perfect for measuring bigger spaces like a swimming pool.

B.2 FINDING VOLUME OF A RECTANGULAR CUBOID

Ex 13: What is the volume of the red figure?



Answer: To find the volume, we count the number of cubes inside the shape. Each cube is 1 cm by 1 cm by 1 cm, so each cube is 1 cm^3 .



The volume is $4+4=8 \text{ cm}^3$.

Ex 14: What is the volume of the red figure?



(°±°)



Answer: To find the volume, we count the number of cubes inside the shape. Each cube is 1 cm by 1 cm by 1 cm, so each cube is 1 cm^3 .



The volume is $6+6=12 \text{ cm}^3$.





Answer: To find the volume, we count the number of cubes inside the shape. Each cube is 1 cm by 1 cm by 1 cm, so each cube is 1 cm^3 .



The volume is $4+4+4=12 \text{ cm}^3$.

Ex 16: What is the volume of the red figure?



Answer: To find the volume, we count the number of cubes inside the shape. Each cube is 1 m by 1 m by 1 m, so each cube is 1 m^3 .



The volume is 12+12=24 m³.

C VOLUME OF A RECTANGULAR CUBOID

C.1 FINDING VOLUMES OF A RECTANGULAR CUBOIDS





Answer: length=4 cm, width=2 cm and height=2 cm.

 $V = \text{length} \times \text{width} \times \text{height}$ $= 4 \text{ cm} \times 2 \text{ cm} \times 2 \text{ cm}$ $= 16 \text{ cm}^3$

Ex 18: What is the volume of the red figure?





 $24\,\big|\,\mathrm{cm}^{\mathbf{3}}$

Answer: Length = 2 cm, width = 4 cm and height = 5 cm.



$$V = \text{length} \times \text{width} \times \text{height}$$
$$= 4 \text{ cm} \times 3 \text{ cm} \times 2 \text{ cm}$$
$$= 24 \text{ cm}^3$$



What is the volume of the red figure?





- Answer: Length = 5 cm, width = 3 cm and height = 5 cm.
 - $V = \text{length} \times \text{width} \times \text{height}$ $= 5 \,\mathrm{cm} \times 3 \,\mathrm{cm} \times 5 \,\mathrm{cm}$ $= 75 \,\mathrm{cm}^3$



What is the volume of the red figure?



 $64 \, \mathrm{cm^{3}}$

Answer: Length = 4 cm, width = 4 cm and height = 4 cm.

$$V = \text{length} \times \text{width} \times \text{height}$$
$$= 4 \text{ cm} \times 4 \text{ cm} \times 4 \text{ cm}$$
$$= 64 \text{ cm}^3$$





40 cm³



$$=40\,\mathrm{cm}^3$$



Ex 22: What is the volume of the red figure?



Answer: Length = 10 cm, width = 10 cm and height = 10 cm.

 $V = \text{length} \times \text{width} \times \text{height}$ $= 10 \,\mathrm{cm} \times 10 \,\mathrm{cm} \times 10 \,\mathrm{cm}$ $= 1000 \, \mathrm{cm}^3$

C.2 SOLVING PROBLEMS

+-×≡ A rectangular swimming pool is 8 m long, 5 m wide, Ex 23: and 2 m deep. The water costs 10 dollars per cubic meter. What is the volume of the swimming pool?

 $|80| m^3$

What is the cost to fill the swimming pool with water?

800 dollars

Answer:

• The volume of the rectangular swimming pool is:

 $V = \text{length} \times \text{width} \times \text{height}$ $= 8 \,\mathrm{m} \times 5 \,\mathrm{m} \times 2 \,\mathrm{m}$ $= 80 \, {\rm m}^3$

• The cost to fill the swimming pool with water is calculated by:

 $Cost = Volume \times cost per m^3$ $= 80 \,\mathrm{m}^3 \times 10 \,\mathrm{dollars \ per \ m^3}$ $= 800 \, \text{dollars}$



Ex 24: A container has a volume of 20 m^3 . A box is 2 m long, 1 m wide, and 0.5 m high. What is the volume of the box?

 $1 m^3$

How many boxes can fit inside the container?

20 boxes

Answer:

• The volume of the box is:

 $V = \text{length} \times \text{width} \times \text{height}$ $= 2 \text{ m} \times 1 \text{ m} \times 0.5 \text{ m}$ $= 1 \text{ m}^3$

• The number of boxes that can fit inside the container is calculated by:

Number of boxes = Volume of container \div Volume of one box

$$= 20 \,\mathrm{m}^3 \div 1 \,\mathrm{m}^3$$
$$= 20 \,\mathrm{boxes}$$

Ex 25: A storage room has a volume of 150 m^3 . A water tank is 5 m long, 2 m wide, and 3 m high. What is the volume of the water tank?

 30 m^3

How many water tanks can fit inside the storage room?

5 water tanks

Answer:

• The volume of the water tank is:

 $V = \text{length} \times \text{width} \times \text{height}$ $= 5 \text{ m} \times 2 \text{ m} \times 3 \text{ m}$ $= 30 \text{ m}^3$

• The number of water tanks that can fit inside the storage room is calculated by:

Number of water tanks = Volume of room \div Volume of one tank = $150 \text{ m}^3 \div 30 \text{ m}^3$ = 5 water tanks

Ex 26: A rectangular fish tank is 2 m long, 1 m wide, and 1 m deep. The water costs 15 dollars per cubic meter. What is the volume of the fish tank?

 $2 m^3$

What is the cost to fill the fish tank with water?

30 dollars

Answer:

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• The volume of the rectangular fish tank is:

 $V = \text{length} \times \text{width} \times \text{height}$ $= 2 \text{ m} \times 1 \text{ m} \times 1 \text{ m}$ $= 2 \text{ m}^{3}$

• The cost to fill the fish tank with water is calculated by:

 $Cost = Volume \times cost \text{ per m}^3$ $= 2 \text{ m}^3 \times 15 \text{ dollars per m}^3$ = 30 dollars