PHYSICS

BOOKS - ICSE

PHYSICAL QUANTITIES AND MEASUREMENT

Solved Examples

1. A box is of dimensions 2.4 m x 1.0 m x 75 cm.

Find the volume of the box.

Watch Video Solution

2. Calculate the volume of a book which is 24 cm in length, 15 cm in breadth and 1 cm in height, in (a) cm^3 (b) m^3 .

Watch Video Solution

3. A measuring cylinder contains water to a level of 22 mL. The water level rises to 30 mL when a piece of copper is completely

immersed in it. Find the volume of copper piece

Watch Video Solution

4. The diameter of a circular park is 30 m. Find its surface area.

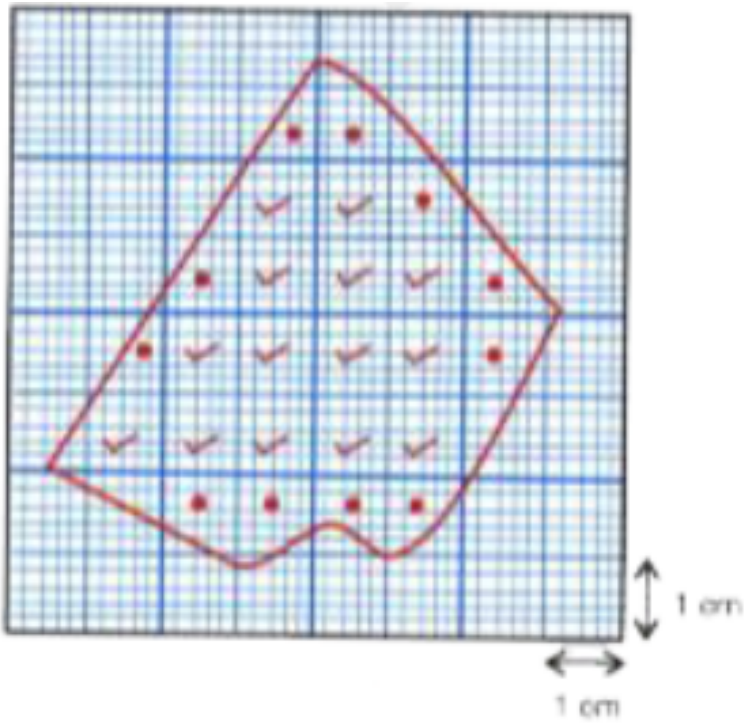
Watch Video Solution

5. The boundary line of an irregular lamina, on a graph paper is shown in Fig. Find the

approximate area of the lamina. In Fig. , the

number of complete squares = 14

The number of squares more than half = 11



Watch Video Solution

6. A piece of iron has a volume of $25cm^3$ and mass 195 g. Find the density of iron in gcm^{-3}

Watch Video Solution

7. A piece of iron has a volume of $25cm^3$ and mass 195 g. Find the density of iron in kgm^{-3}

Watch Video Solution

8. The density of silver is $10gcm^{-3}$. Find the mass of a silver block of volume $200cm^3$.

Watch Video Solution

9. The mass of a wooden block is 56 g. If the density of wood is $0.8gcm^{-3}$, find the volume of block.

Watch Video Solution

10. The mass of 1 litre of water is 1 kg. Find the density of water in gcm^{-3}

Watch Video Solution

11. The mass of 1 litre of water is 1 kg. Find the density of water in kgm^{-3}

Watch Video Solution

12. The length, breadth and height of a room are 8 m, 5 m and 3 m respectively. If density of air is $1.29kgm^{-3}$, find the mass of air in the room.

Watch Video Solution

13. A copper piece of mass 88 g when immersed completely into water contained in a measuring cylinder, raises the level of water

from 15 mL to 25 mL. Find the volume of copper piece

Watch Video Solution

14. A copper piece of mass 88 g when immersed completely into water contained in a measuring cylinder, raises the level of water from 15 mL to 25 mL. Find the density of copper.

Watch Video Solution

15. Convert the speeds in ms^{-1}

$3 km \min^{-1}$

Watch Video Solution

16. Convert the speeds in ms^{-1}

$36 kmh^{-1}$

Watch Video Solution

17. A car travels a distance of 200 km in 3 h. Find the speed of car in `ms^(-1)

Watch Video Solution

18. A cyclist is moving with a speed of $20kmh^{-1}$. How long will he take to travel a distance of 1.5 km ?

Watch Video Solution

19. A car travels for 20 min with a constant speed of 54 km h^{-1} Find the distance travelled by the car.

Watch Video Solution

20. A body A travels a distance 600 m in 1 min while body B travels a distance 1 km in 20 s. Which body moves faster ? Give reason.

Watch Video Solution

21. A piece of steel has a volume of $10cm^3$ and a mass of 80 g. What is its density in:

g/cm^3

Watch Video Solution

22. A piece of steel has a volume of $10cm^3$ and a mass of 80 g. What is its density in:

kg/m^3

Watch Video Solution

23. What is the mass of $5m^3$ of cement of density $2000kg/m^3$?

Watch Video Solution

24. Mass of a stone is 50g. When it is immersed in water the level rises from 45mL to 75mL. Determine the density of the stone.

Watch Video Solution

25. A block is 8 cm long, 2 cm wide, and 3 cm high and has a mass 375 g.

What is its density?

Watch Video Solution

26. A block is 8 cm long, 2 cm wide, and 3 cm high and has a mass 375 g.

Express density in kg/m^3

Watch Video Solution

27. A block is 8 cm long, 2 cm wide, and 3 cm high and has a mass 375 g.

Compare the density of the block with the density of different substances in Table and find out what material the block is made of.

Watch Video Solution

28. What is the mass of a piece of wood that has a density of $0.85g/cm^3$ and a volume of $29.4cm^3$?

Watch Video Solution

29. An empty bottle weighs 30 g. It weighs 54 g when filled with kerosene. If the volume of the bottle is 30 mL, find the density of kerosene in g/cm^3 and in kg/m^3

Watch Video Solution

30. A boy starts from home, goes to a shop, which is 2 km away, buys things, and comes

back in an hour. What is the speed with which he travels?

Watch Video Solution

31. A girl runs along a circular track of radius 5 m starting from point A. What will be the distance travelled by her and speed if she comes back to the initial position in 300 s

Watch Video Solution

32. A girl runs along a circular track of radius 5 m starting from point A. What will be the distance travelled by her and speed

if she stops halfway at B in 400 s?

Watch Video Solution

33. A Volvo bus covers 240 km in three hours and a car covers 250 km in five hours. Which is faster?

Watch Video Solution

34. Ria covered a distance of 600 m in two minutes whereas Lia covered the same distance in three minutes. Who is faster?

Watch Video Solution

35. If a bus travels a distance of 30 km in 45 minutes. What will be its speed in:

$km / \min$

Watch Video Solution

36. If a bus travels a distance of 30 km in 45 minutes. What will be its speed in:

km/hr

Watch Video Solution

37. If a bus travels a distance of 30 km in 45 minutes. What will be its speed in:

km/s

Watch Video Solution

38. If a bus travels a distance of 30 km in 45 minutes. What will be its speed in:

m/s

Watch Video Solution

Test Yourself True Or False

1. The S.I. unit of volume is litre. True/False.

Watch Video Solution

2. A measuring beaker of capacity 200 mL can measure only the volume of 200 mL of a liquid. True.False.

Watch Video Solution

3. cm^2 is a smaller unit of area than m^2.

Watch Video Solution

4. Write true or false Equal volumes of two different substances have equal masses.

Watch Video Solution

5. The S.I. unit of density is .....

Watch Video Solution

6. $1gcm^{-3} = 1000kgm^{-3}$

Watch Video Solution

7. The density of water is maximum at $4^{\circ} C$.

Watch Video Solution

8. The speed $5ms^{-1}$ is less than $25kmh^{-1}$

Watch Video Solution

9. The S.I. unit of speed is ms^{-1}

Watch Video Solution

Test Yourself Fill In The Blanks

1. $1m^3$ = ...cm^3

Watch Video Solution

2. The volume of an irregular solid is determined by the method of _____ of a liquid.

Watch Video Solution

3. Volume of a cube =.....

Watch Video Solution

4. The area of an irregular lamina is measured by using a .....

Watch Video Solution

5. Mass = density x .....

Watch Video Solution

6. The S.I. unit of density is .....

Watch Video Solution

7. $1gcm^{-3}$ = ... kgm^{-3}

Watch Video Solution

8. $36kmh^{-1}$ = ... ms^{-1} .

Watch Video Solution

9. Distance travelled d = ... x time t.

Watch Video Solution

Test Yourself Match The Column

1. Match the following

	Column A		Column B
(a)	Volume of a liquid	(i)	kg m^{-3}
(b)	Area of a leaf	(ii)	m^3
(c)	S.I. unit of volume	(iii)	graph paper
(d)	S.I. unit of density	(iv)	m s^{-1}
(e)	S.I. unit of speed	(v)	measuring cylinder

Watch Video Solution

Test Yourself Select The Correct

1. One litre is equal to :

A. $1cm^3$

B. $1m^3$

C. $10^{-3}cm^3$

D. $10^{-3}m^3$

Answer: D

Watch Video Solution

2. A metallic piece displaces water of volume 15 mL. The volume of piece is :

A. $15cm^3$

B. $15m^3$

C. $15 \times 10^3 cm^{-3}$

D. $15 \times 10^3 cm^3$

Answer: A

Watch Video Solution

3. A piece of paper of dimensions 1.5 m x 20 cm has area :

A. $30m^2$

B. $300cm^2$

C. $0.3m^2$

D. $3000m^3$

Answer: C

Watch Video Solution

4. The correct relation is :

A. $d = M \times V$

B. $M = d \times V$

C. $V = d \times M$

D. $d = M + V$

Answer: B

Watch Video Solution

5. The density of alcohol is $0.8gcm^{-3}$. In S.I. unit, it will be :

A. $0.8kgm^{-3}$

B. $0.0008kgm^{-3}$

C. $800kgm^{-3}$

D. $8 \times 10^{3}kgm^{-3}$

Answer: C

Watch Video Solution

6. The density of aluminium is $2.7gcm^{-3}$ and of brass is $84gcm^{-3}$. For the same mass, the volume of :

A. both will be same

B. aluminium will be less than that of brass

C. aluminium will be more than that of brass

D. nothing can be said.

Answer: C

Watch Video Solution

7. A block of wood of density $0.8gcm^{-3}$ has a volume of $60cm^3$. The mass of block will be :

A. 60.8 g

B. 75g

C. 48g

D. 0.013 g

Answer: C

Watch Video Solution

8. The correct relation for speed is :

A. Speed = distance x time

B. Speed = distance/time

C. Speed = time/distance

D. Speed = 1/(distance x time)

Answer: B

Watch Video Solution

9. A boy travels a distance 150 m in 1 minute.

His speed is :

A. $150ms^{-1}$

B. $2.5ms^{-1}$

C. $25ms^{-1}$

D. $9ms^{-1}$

Answer: B

Watch Video Solution

Test Yourself Short Long Answer Questions

1. Define the term volume of an object.

Watch Video Solution

2. State and define the S.I. unit of volume.Draw their neat diagrams.

Watch Video Solution

3. State two smaller units of volume. How are they related to the S.I. unit ?

Watch Video Solution

4. How will you determine the volume of a cuboid ? Write the formula you will use.

Watch Video Solution

5. Name two devices which are used to measure the volume of an object.

Watch Video Solution

6. How can you determine the volume of an irregular solid (say a piece of brass) ? Describe in steps with neat diagrams.

Watch Video Solution

7. You are required to take out 200 mL of milk from a bucket full of milk. How will you do it?

Watch Video Solution

8. Describe the method in steps to find the area of an irregular lamina using a graph paper.

Watch Video Solution

9. Define the term density of a substance.

Watch Video Solution

10. State the S.I. and C.G.S. units of density. How are they related ?

Watch Video Solution

11. 'The density of brass is 8.4 g cm^{-3} '. What do you mean by the statement ?

Watch Video Solution

12. Arrange the following substances in order of their increasing density :

(a) iron (b) cork (c) brass (d) water (e) mercury.

Watch Video Solution

13. How does the density of water change when : it is heated from $0^{\circ} C$ to $4^{\circ} C$

Watch Video Solution

14. How does the density of water change when : it is heated from $4^{\circ} C$ to $10^{\circ} C$?

Watch Video Solution

15. Write the density of water at $4^{\circ} C$.

Watch Video Solution

16. Explain the meaning of the term speed.

Watch Video Solution

17. Write the S.I. unit of speed.

Watch Video Solution

18. A car travels with a speed $12ms^{-1}$, while a scooter travels with a speed $36kmh^{-1}$ Which of the two travels faster?

Watch Video Solution

Test Yourself Numericals

1. The length, breadth and height of a water tank are 5 m, 2.5 m and 1.25 m respectively. Calculate the capacity of the water tank in m^3

Watch Video Solution

2. The length, breadth and height of a water tank are 5 m, 2.5 m and 1.25 m respectively. Calculate the capacity of the water tank in litre

Watch Video Solution

3. A solid silver piece is immersed in water contained in a measuring cylinder. The level of water rises from 50 mL to 62 mL. Find the volume of silver piece.

Watch Video Solution

4. Find the volume of a liquid present in a dish of dimensions 10 cm x 10 cm x 5 cm.

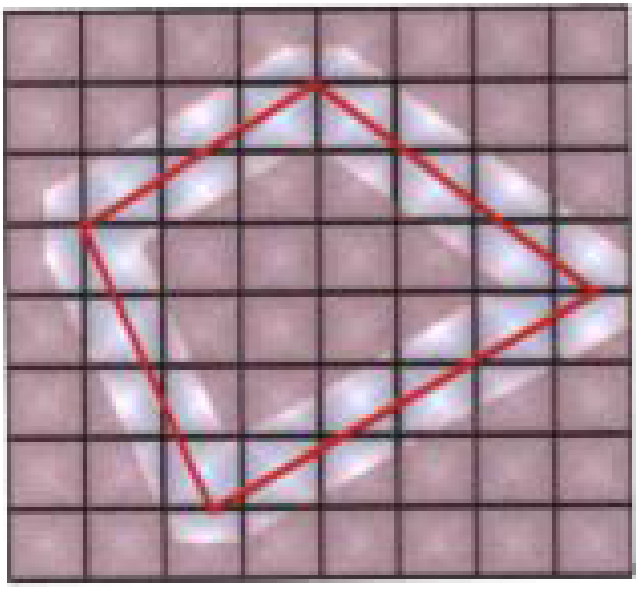
Watch Video Solution

5. A rectangular field is of length 60 m and breadth 35 m. Find the area of the field.

Watch Video Solution

6. Find the approximate area of an irregular lamina of which boundary line is drawn on the

graph paper shown in Fig.



Watch Video Solution

7. A piece of brass of volume $30cm^3$ has a mass of 252 g. Find the density of brass in gcm^{-3}

Watch Video Solution

8. A piece of brass of volume $30cm^3$ has a mass of 252 g. Find the density of brass in kgm^{-3}

Watch Video Solution

9. The mass of an iron ball is 312 g. The density of iron is $7.8gcm^{-3}$. Find the volume of the ball.

Watch Video Solution

10. A cork has a volume $25cm^3$. The density of cork is $0.25gcm^{-3}$. Find the mass of the cork.

Watch Video Solution

11. The mass of 5 litre of water is 5 kg. Find the density of water in g cm^{-3}

Watch Video Solution

12. A cubical tank of side 1 m is filled with 800 kg of a liquid. Find the volume of tank

Watch Video Solution

13. A cubical tank of side 1 m is filled with 800 kg of a liquid. Find the density of liquid in kg m^{-3}

Watch Video Solution

14. A block of iron has dimensions 2 m x 0.5 m x 0.25 m. The density of iron is $7.8gcm^{-3}$. Find the mass of block.

Watch Video Solution

15. The mass of a lead piece is 115 g. When it is immersed into a measuring cylinder, the water level rises from 20 mL mark to 30 mL mark. Find the volume of the lead piece

Watch Video Solution

16. The mass of a lead piece is 115 g. When it is immersed into a measuring cylinder, the water level rises from 20 mL mark to 30 mL mark. Find the density of the lead in kg m^{-3}

Watch Video Solution

17. The density of copper is $8.9gcm^{-3}$. What will be its density in kg m^{-3}

Watch Video Solution

18. A car travels a distance of 15 km in 20 minute. Find the speed of the car in kmh^{-1}

Watch Video Solution

19. A car travels a distance of 15 km in 20 minute. Find the speed of the car in ms^{-1}

Watch Video Solution

20. How long a train will take to travel a distance of 200 km with a speed of 60 km h^{-1} ?

Watch Video Solution

21. A boy travels with a speed of 10 ms^{-1} for 30 minute. How much distance does he travel ?

Watch Video Solution

22. Express $36kmh^{-1}$ in ms^{-1} .

Watch Video Solution

23. Express 15 ms^(-1) in kmh^(-1)

Watch Video Solution

Questions

1. Choose the correct option to fill in the blank

Physical quantities are quantities that ..... (cannot be measured/ can be measured)

Watch Video Solution

2. Choose the correct option to fill in the blank

Area is a ..... (fundamental / derived quantity)

Watch Video Solution

3. Choose the correct option to fill in the blank

SI unit of volume is ..... $\left(m^2 / m^3\right)$

Watch Video Solution

4. Choose the correct option to fill in the blank

$1m^3$ is ..... $(100mL / 1000000mL)$

Watch Video Solution

5. Write T for True and F for the False. Correct the false statement

The amount of surface covered by a closed shape is called area.

Watch Video Solution

6. Write T for True and F for the False. Correct the false statement

The area of a piece of paper is measured in km^2

Watch Video Solution

7. Write T for True and F for the False. Correct the false statement

The formula for calculating area is length x breadth for rectangle.

Watch Video Solution

8. Write T for True and F for the False. Correct the false statement

We cannot find the area of irregular surfaces.

Watch Video Solution

9. Choose the correct option to fill in the blank

If more mass is packed into the same volume.

Then density is ..... (more/less)

Watch Video Solution

10. Choose the correct option to fill in the blank

The density of a subtance ..... (varies/remains the same) with change in size

Watch Video Solution

11. Choose the correct option to fill in the blank

$$1g/cm^3 = \left(\frac{1}{1,000}/1000\right)kg/m^3$$

Watch Video Solution

12. Choose the correct option to fill in the blank

the density of solids is generally ..... (higher/lower) than density of liquids.

Watch Video Solution

Exercise Section I A Name The Following

1. Name

Any four fundamental physical quantities.

Watch Video Solution

2. Name any two derived physical quantities

Watch Video Solution

3. Name

Mass per unit volume

Watch Video Solution

4. Name

Si unit for volume

Watch Video Solution

5. Name

Distance travelled in unit time

Watch Video Solution

Exercise Section I B Choose The Correct Option

1. A fundamental physical quantity

A. Speed

B. time

C. area

D. volume

Answer:

Watch Video Solution

2. 1L is

A. $1000cm^3$

B. $1000cm^2$

C. $1000mL$

D. $100cm^2$

Answer:

Watch Video Solution

3. The volume of a stone can be measured by

A. using the appropriate formula

B. dipping into a measuring cylinder.

C. using a graph paper and counting the squares.

D. can't say

Answer:

4. If the same mass is packed into a lesser volume its density becomes:

A. Higher

B. lower

C. same as before

D. can't say

Answer:

Watch Video Solution

5. SI unit of speed

A. km / h

B. m / s

C. $km / \min$

D. cm / s

Answer:

Watch Video Solution

Exercise Section I C Write T For True And F For False Correct The False Statements

1. Physics is a subject that deals with quantities that cannot be measured.

Watch Video Solution

2. Only solids have volume.

Watch Video Solution

3. One hectometre is $10,000 m^2$

Watch Video Solution

4. Each substance has a unique density associated with it

 Watch Video Solution

5. The object that covers a given distance in a lesser time has more speed.

 Watch Video Solution

Exercise Section I D Choose The Correct Option To Fill In The Blank

1. When you measure a liquid the reading should be taken at the bottom of the ..... (concave/convex) meniscus.

Watch Video Solution

2. Volume of a cuboid is ?

Watch Video Solution

3. The SI unit of density is :

Watch Video Solution

4. Choose the correct option to fill in the blank

$1g/cm^3 = \left(\frac{1}{1,000}/1000\right)kg/m^3$

Watch Video Solution

5. If the distance covered in unit time is more, then the speed will be ..... (greater/lesser)

Watch Video Solution

Exercise Section Ii E Give Reasons For The Following

1. Why is area a derived quantity?

Watch Video Solution

2. Equal volumes of sand and cotton weigh differently. TRUE or FALSE ?

Watch Video Solution

3. When you put a steel pin in water it sinks, but a ship made of steel floats. WHY ?

Watch Video Solution

4. If you take kerosene and water in a test tube, kerosene floats on water.

Watch Video Solution

Exercise Section Ii F Distinguish Between The Following

1. what are Fundamental and derived quantities ?

Watch Video Solution

2. Capacity and volume

Watch Video Solution

3. Give relation between mL and cm^3

Watch Video Solution

4. Define Area and volume

Watch Video Solution

5. what is the relation between Mass and density.

Watch Video Solution

6. What is the relation between Speed and distance.

Watch Video Solution

Exercise Section Ii G Short Answer Questions

1. What do you mean by volume? In what units do you express volume of water in a swimming pool?

Watch Video Solution

2. What do you mean by area? What is the relationship between cm^2 and m^2?

Watch Video Solution

3. How can you decrease the average density of an object?

Watch Video Solution

4. Define speed. How do you convert $1km/h$ to m/s.

Watch Video Solution

Exercise Section Ii H Long Answer Questions

1. What do you mean by physical quantities? Explain fundamental and derived quantities with two examples of each

Watch Video Solution

2. Explain how to find the density of an irregular solid, say a stone.

Watch Video Solution

3. Describe how to determine the density of a liquid.

Watch Video Solution

Exercise Section Ii I Numerical Questions

1. If $103cm^3$ of aluminium has a mass of 0.280 kg. Find its density in g/cm^3

Watch Video Solution

2. If $103cm^3$ of aluminium has a mass of 0.280 kg. Find its density in kg/m^3

Watch Video Solution

3. If the density of wood is $800kg/m^3$ and volume is $0.3m^3$ find its mass.

Watch Video Solution

4. The density of gold is $19g/cm^3$ find the volume of

38 g

Watch Video Solution

5. The density of gold is $19g/cm^3$ find the volume of

0.095 kg

Watch Video Solution

6. An elephant covers 120 km in 3 hours and a tiger covers 130 km in 2 hours. Which is faster? What is its speed?

Watch Video Solution

7. Bike A covers a distance of 145 km in 1.5 h. Bike B covers a distance of 200 km in 2 h. Which of the two bikes is faster?

Watch Video Solution

8. Convert

$2m^3$ into cm^3

Watch Video Solution

9. Convert

$5000cm^3$ to m^3

Watch Video Solution

10. Convert

$23m^3$ to cm^2

Watch Video Solution

11. Convert

$4000cm^2$ to m^2

Watch Video Solution

12. Convert

$7.8g/cm^3$ to kg/m^3

Watch Video Solution

13. Convert

$920kg/m^3$ to g/cm^3

Watch Video Solution

14. Convert $54kmh^{-1}$ into ms^{-1}.

Watch Video Solution

15. Convert

$20m/s$ to km/h

Watch Video Solution

16. A car travels a distance of 75 km in 1.5 hours

What is its speed ?

Watch Video Solution

17. A car travels a distance of 75 km in 1.5 hours

What is its speed ?

Watch Video Solution

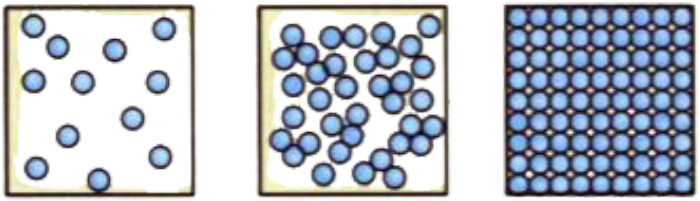
18. An empty beaker weighs 100 g. When filled with 60 ml of salt solution it weighs 172 g. What is the density of the salt solution?

Watch Video Solution

Exercise Picture Study

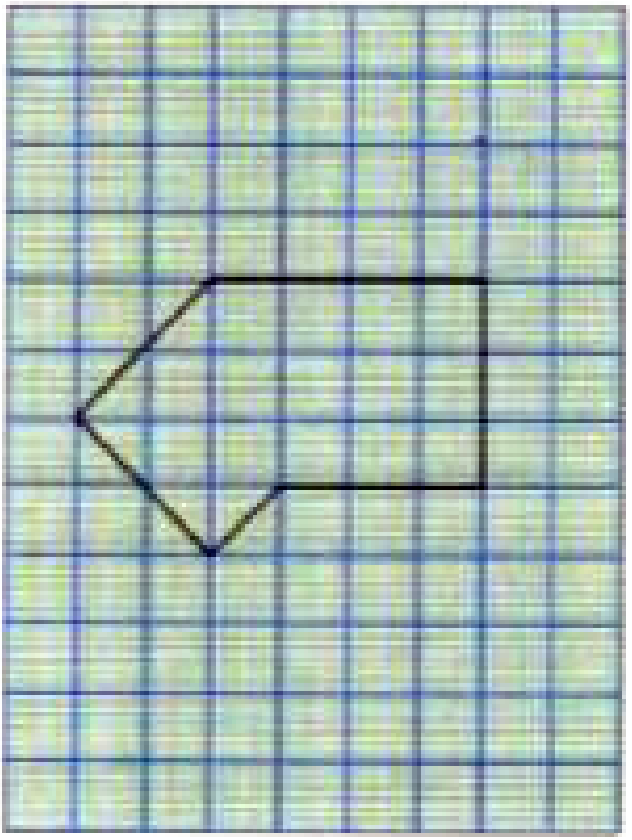
1. In the following figure, the volumes of the boxes are the same. Which one is more denser

and which one is lighter? Why?



Watch Video Solution

2. Find the area of the figure given below. Each grid measures $1cm^2$



Watch Video Solution

3. The table given below gives density of different substances.

a. Which is heavier-$1m^3$ of steel or $1m^3$ of aluminium?

b. Which is heavier-1 kg of steel or 1 kg of cork?

Substance	Density (kg/m^3)
Wood	650
Ice	920
Aluminium	2,700
Lead	11,300
Iron	7,800
Gold	19,320
Cork	250
Polythene	920
Steel	7,900

Watch Video Solution