

# MATTER PROPERTIES EXAM

NAME AND SURNAME:-----

1) Define the following concepts: 1 point

a) Matter.

b) Inertia.

**ANSWER:**

a) MATTER: it is everything that has mass and occupies space.

b) INERTIA: it is the resistance a body offers to changes to its state of rest or movement.

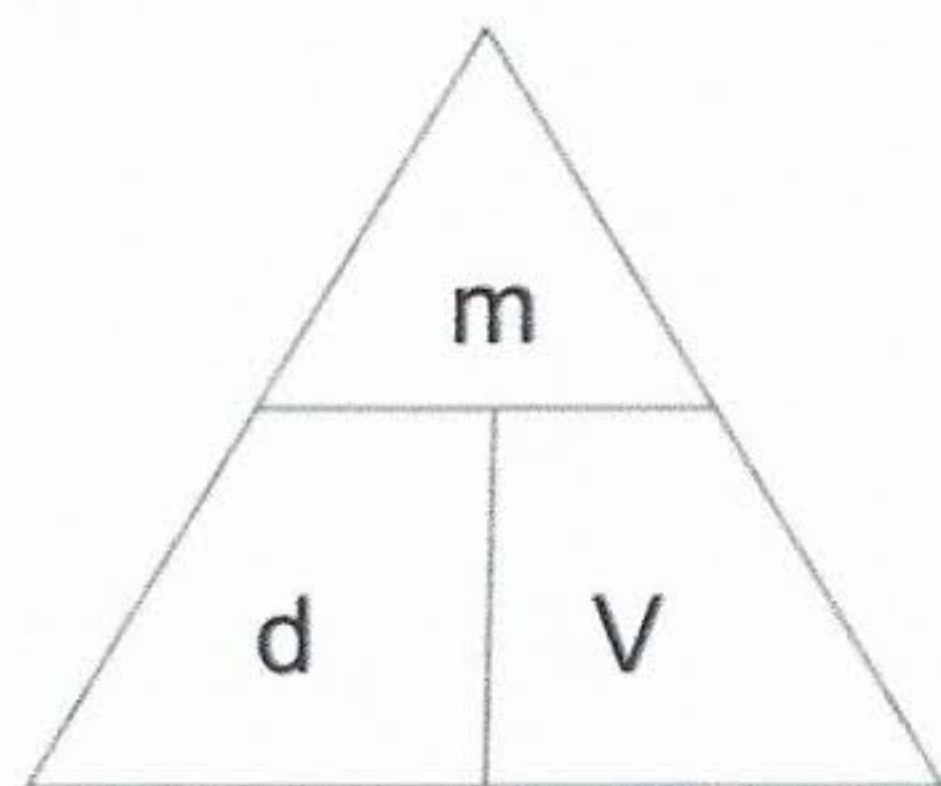
2) A bar of soap is 12 cm tall, 6 cm wide and 10 cm long. It has a mass of 415 grams. What is the density of the bar of soap? 2 points

**SOLUTION:**

Let us calculate the volume first:

$$V = 12 \cdot 6 \cdot 10 = 720 \text{ cm}^3$$

Then, we are going to calculate the density which is the quantity we have been asked for:



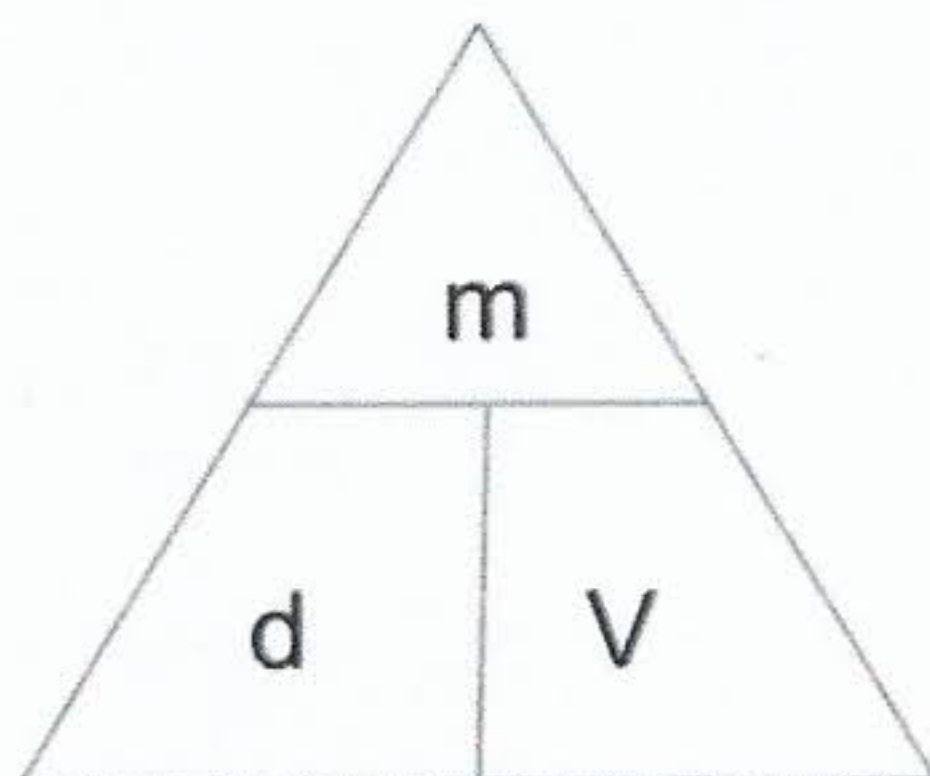
$$d = \frac{m}{V}$$

$$d = \frac{415 \text{ g}}{720 \text{ cm}^3} = 0,58 \text{ g/cm}^3$$



3) A pencil has a density of 0,875 g/mL. It has a mass of 3,5 g. What is the volume? 2 points

SOLUTION:

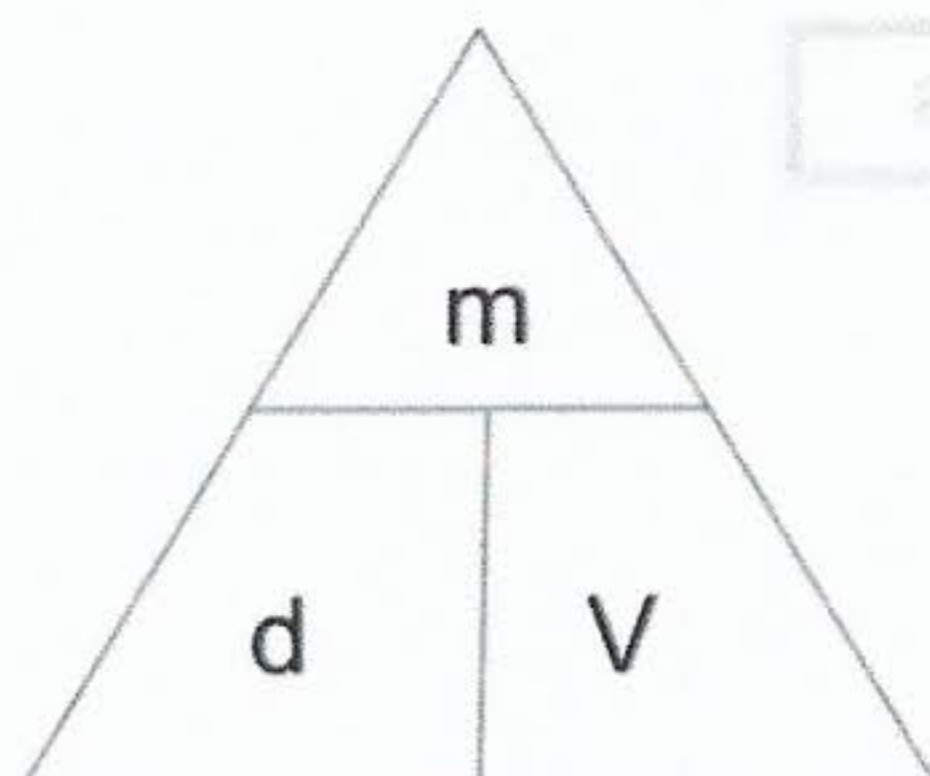


$$V = \frac{m}{d}$$

$$V = \frac{3,5 \cancel{g}}{0,875 \cancel{g/mL}} = 4 \text{ mL}$$

4) If the density of 45 cm<sup>3</sup> block of wood is 0,65 g/mL, calculate the wood's mass. 2 points

SOLUTION:



$$m = d \cdot V$$

$$m = 0,65 \frac{g}{mL} \cdot 45 \text{ mL} = 29,25 \text{ g}$$



5) By means of conversion factors, transform the following units:

2 points

a)  $7,14 \text{ g/cm}^3$  into  $\text{kg/m}^3$

b)  $19\,300 \text{ kg/m}^3$  into  $\text{g/cm}^3$

c)  $1740 \text{ kg/m}^3$  into  $\text{g/cm}^3$

d)  $10,5 \text{ g/cm}^3$  into  $\text{kg/m}^3$

**SOLUTION:**

$$\text{a) } 7,14 \frac{\text{g}}{\text{cm}^3} \cdot \frac{1 \text{ kg}}{1\,000 \text{ g}} \cdot \frac{1\,000\,000 \text{ cm}^3}{1 \text{ m}^3} = 7\,140 \text{ kg/m}^3$$

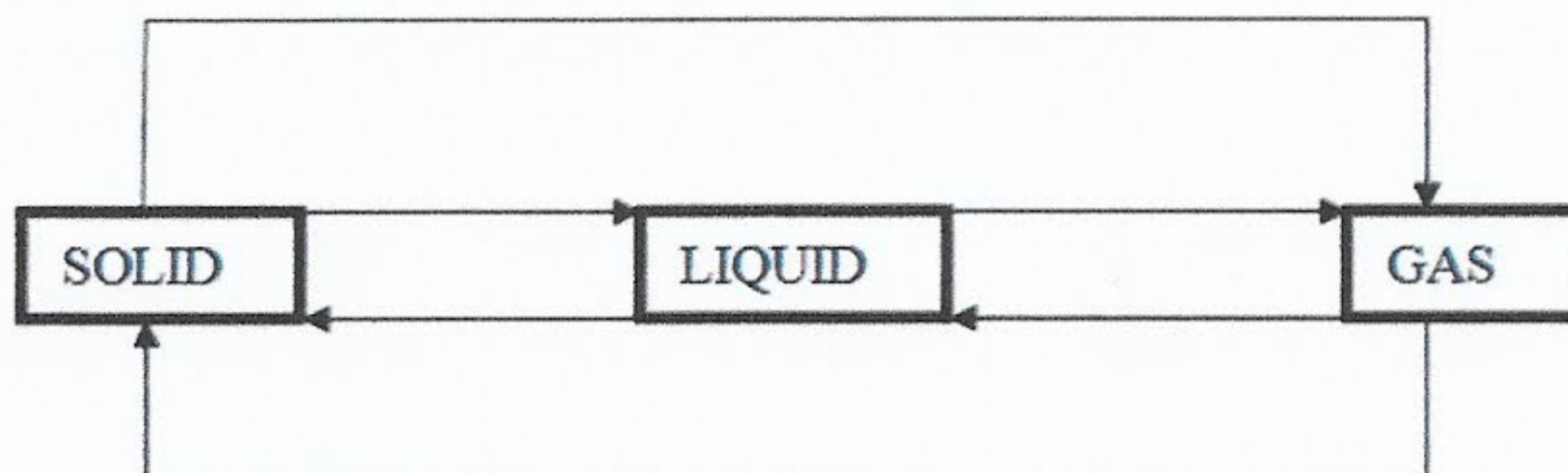
$$\text{b) } 19\,300 \frac{\text{kg}}{\text{m}^3} \cdot \frac{1\,000 \text{ g}}{1 \text{ kg}} \cdot \frac{1 \text{ m}^3}{1\,000\,000 \text{ cm}^3} = 19,3 \text{ g/cm}^3$$

$$\text{c) } 1\,740 \frac{\text{kg}}{\text{m}^3} \cdot \frac{1\,000 \text{ g}}{1 \text{ kg}} \cdot \frac{1 \text{ m}^3}{1\,000\,000 \text{ cm}^3} = 1,74 \text{ g/cm}^3$$

$$\text{d) } 10,5 \frac{\text{g}}{\text{cm}^3} \cdot \frac{1 \text{ kg}}{1\,000 \text{ g}} \cdot \frac{1\,000\,000 \text{ cm}^3}{1 \text{ m}^3} = 10\,500 \text{ kg/m}^3$$

6) Fill the following diagram with the corresponding names of the changes of state:

1 point



**ANSWER:**

