Answers Extra Problems Density

Problem 1

$$V=l∙h∙w$$

$$V=150∙10^{3}m ∙0,3m ∙7,0m= 315000m^{3}$$

$$ρ=2500 ^{kg}/\_{m^{3}}$$

$ρ=\frac{m}{V}$ $m=ρ∙V=2500 ^{kg}/\_{m^{3}}∙ 315000m^{3}=7,875 ∙10^{8}kg$

Problem 2

$$V=l∙h∙w$$

$$V=1,83m ∙2,13m ∙0,229m= 0,89m^{3}$$

$$ρ=1000 ^{kg}/\_{m^{3}}$$

$ρ=\frac{m}{V}$ $m=ρ∙V=1000 ^{kg}/\_{m^{3}}∙ 0,89m^{3}=890 kg$ So it exceeds the allowed mass and it should not be purchased.

Problem 3

First you calculate the mass of the soda

$$V\_{soda}=3,54 ∙10^{-4}m^{3}$$

$$ρ\_{soda}=1000 ^{kg}/\_{m^{3}}$$

$ρ=\frac{m}{V}$ $m\_{soda}=ρ∙V=1000 ^{kg}/\_{m^{3}}∙ 3,54 ∙10^{-4}m^{3}=0,354 kg$

The mass of the can is $m\_{can}=0,416kg-0,354kg=0,062kg$

$$ρ\_{can}=2700 ^{kg}/\_{m^{3}}$$

$$ρ=\frac{m}{V} V\_{can}=\frac{m}{ρ}=\frac{0,062kg}{2700 ^{kg}/\_{m^{3}}}=2,3 ∙10^{-5}m^{3} $$

Problem 4

$$m=393 kg$$

$$V=0,05 m^{3}$$

$ρ=\frac{m}{V}= \frac{393 kg}{0,05 m^{3}}=7860 ^{kg}/\_{m^{3}}$ The substance is the metal iron.

Problem 5

$$m\_{water}=20000 kg$$

$$ρ\_{water}=1000 ^{kg}/\_{m^{3}}$$

$$ρ=\frac{m}{V} V\_{water}=\frac{m}{ρ}=\frac{20000kg}{1000 ^{kg}/\_{m^{3}}}=20 m^{3}$$

$$m\_{gasoline}=20000 kg$$

$$ρ\_{gasoline}=680 ^{kg}/\_{m^{3}}$$

$$ρ=\frac{m}{V} V\_{gasoline}=\frac{m}{ρ}=\frac{20000kg}{680 ^{kg}/\_{m^{3}}}=29 m^{3}$$

Problem 6

$$V=l∙h∙w$$

$$V=0,3m ∙0,3m ∙0,2m= 0,018m^{3}$$

$$ρ\_{gold}=19300 ^{kg}/\_{m^{3}}$$

$ρ=\frac{m}{V}$ $m=ρ∙V=19300 ^{kg}/\_{m^{3}}∙ 0,018m^{3}=347kg$

This is too heavy to be carried by 1 person

Problem 7

$$m=10000 kg$$

$$ρ\_{copper}=8930 ^{kg}/\_{m^{3}}$$

$$ρ=\frac{m}{V} V=\frac{m}{ρ}=\frac{10000kg}{8930 ^{kg}/\_{m^{3}}}=1,12 m^{3}$$

Problem 8

$$V\_{helium}=900m^{3}$$

$$ρ\_{helium}=0,18 ^{kg}/\_{m^{3}}$$

$ρ=\frac{m}{V}$ $m\_{helium}=ρ∙V=0,18 ^{kg}/\_{m^{3}}∙ 900m^{3}=162 kg$

$$V\_{air}=900m^{3}$$

$$ρ\_{air}=1,29 ^{kg}/\_{m^{3}}$$

$ρ=\frac{m}{V}$ $m\_{air}=ρ∙V=1,29 ^{kg}/\_{m^{3}}∙ 900m^{3}=1161 kg$

Braincracker

This is an assignment you don’t have to do. It refers to terms we didn’t do and you don’t have to know.