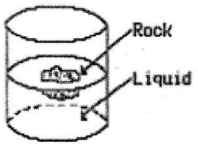
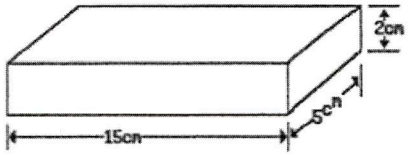
Name: Density Test Review

1) The diagram below shows a glass jar containing a clear liquid and a floating rock. Which conclusion about the relative density of the rock and the liquid is true?



A) The rock and the liquid have the same density.
B) The rock is less dense than the liquid.
C) The rock is more dense than the liquid.

2) The diagram below represents a rectangular object with a mass of 450 grams. According to the *Earth Science Reference Tables*, what is the density of the object?



not drawn to scale

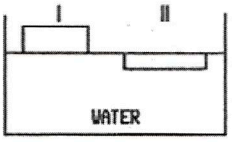
A) 2 grams per cubic centimeter
B) 4 grams per cubic centimeter
C) 1 gram per cubic centimeter
D) 3 grams per cubic centimeter

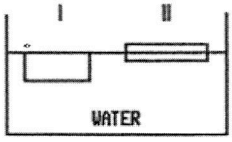
$V = 15 \cdot 5 \cdot 2 = 150\ cm^3$

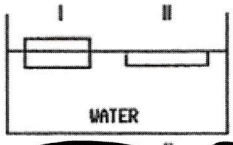
$D = \frac{450\ g}{150\ cm^3}$

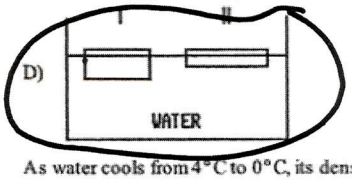
$D = 3\ g/cm^3$

3) The diagrams below represent two differently shaped blocks of ice floating in water. Which diagram most accurately shows the blocks of ice as they would actually float in water?

A)


B)


C)


D)


4) As water cools from 4°C to 0°C, its density
A) increases
B) decreases
C) remains the same

5) What is the density of a rock which has a mass of 35 grams and a volume of 7.0 cubic centimeters?

A) 42 g/cm^3
B) 0.20 g/cm^3
C) 28 g/cm^3
D) 5.0 g/cm^3

$D = \frac{35\ g}{7.0\ cm^3}$

$D = 5\ g/cm^3$

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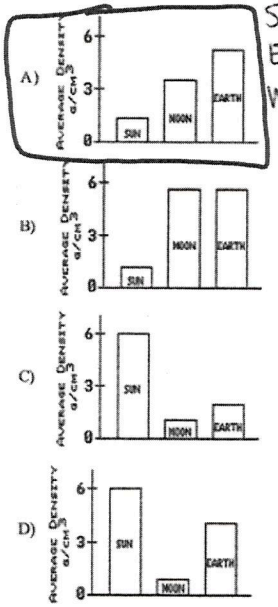
6) According to the *Earth Science Reference Tables*, which graph best represents the average densities of the Sun, Moon, and Earth?

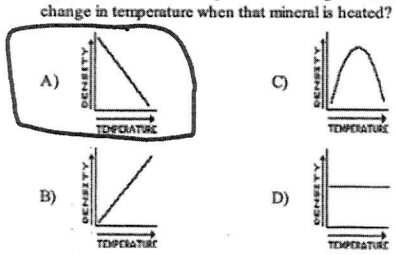
Density
Sun 1.3
Earth 5.5
Moon 3.2



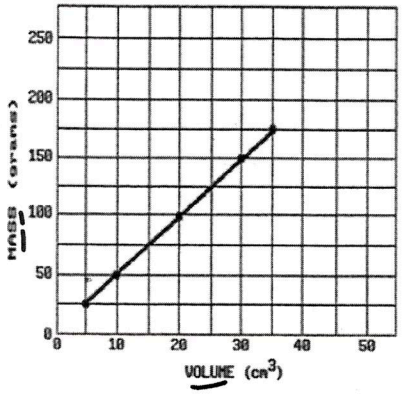
7) An empty 250-milliliter beaker has a mass of 60 grams. When 100 milliliters of oil is added to the beaker, the total mass is 140 grams. The density of the oil is approximately

A) 1.7 g/ml
B) 1.4 g/ml
C) 0.8 g/ml
D) 0.6 g/ml

8) A mineral expands when heated. Which graph best represents the relationship between change in density and change in temperature when that mineral is heated?



Questions 9 through 12 refer to the following:



150/30 = 5

The graph above shows the mass and volume for five different samples of the mineral pyrite.

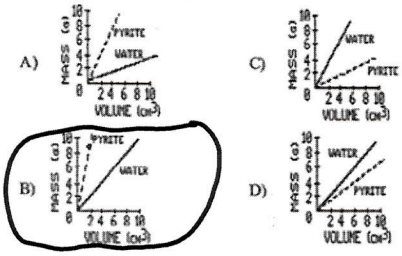
9) According to the graph above, the density of pyrite is about

A) 0.5 g/cm3
B) 7.5 g/cm3
C) 2.5 g/cm3
D) 5.0 g/cm3

10) If one of the original samples of pyrite were cut in half, the density of each half would be

A) less than the original sample
B) the same as the original sample
C) greater than the original sample

11) The density of pyrite and the density of water were plotted on the same graph. Which diagram below best represents how the graph should appear?



12) If a sample of pyrite has a volume of 50 cm3, its mass would be

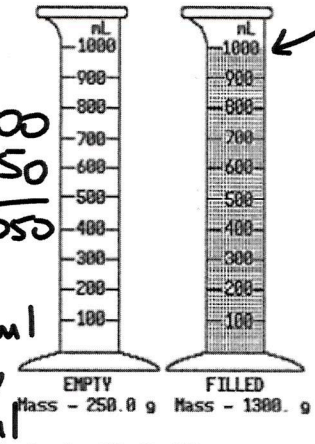
A) 350 g
B) 15 g
C) 150 g
D) 250 g

M = D · V
M = 5 · 50
M = 250 g

0.1 + beaker = 140 g
beaker = 60 g
80 g

D = 80 g / 100 ml
D = .8 g/ml

13) As shown below, an empty 1,000.-milliliter container has a mass of 250.0 grams. When filled with a liquid, the container and the liquid have a combined mass of 1,300. grams.

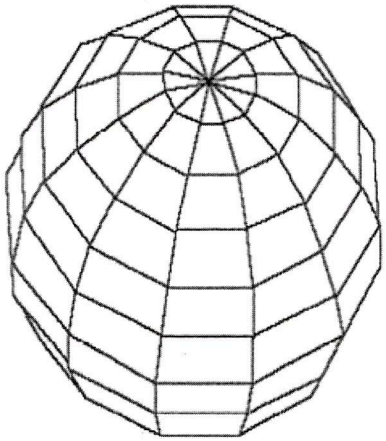


What is the density of the liquid?

A) 0.95 g/mL
B) 1.05 g/mL
C) 1.00 g/mL
D) 1.30 g/mL

Questions 14 through 16 refer to the following:

The diagram below represents a three-dimensional solid object of uniform material.



MASS = 80.0 grams
VOLUME = 25 cm^3

14) The mass of the object could best be determined by

A) counting the number of flat surfaces it contains
B) comparing it with a known standard mass
C) calculating its circumference
D) placing it in a beaker of water

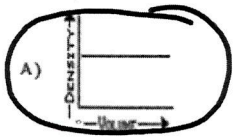
15) If the object is cut in half, the density of each piece will be

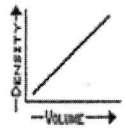
A) greater than that of the original object
B) the same as that of the original object
C) less than that of the original object

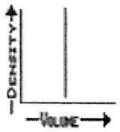
16) What is the density of the object?

A) 3.2 g/cm^3
B) 5.5 g/cm^3
C) 0.3 g/cm^3
D) 1.3 g/cm^3

17) A student calculates the densities of five different pieces of aluminum, each having a different volume. Which graph best represents this relationship?

A)


C)


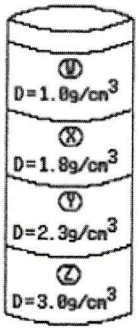
B)


D)

18) In which phase (state) do most Earth materials have their *greatest* density?

A) gaseous
B) solid
C) liquid

19) The diagram below represents a cylinder which contains four different liquids, *W*, *X*, *Y*, and *Z*, each with a different density (*D*) as indicated. A piece of solid quartz having a density of 2.7 g/cm^3 is placed on the surface of liquid *W*. When the quartz is released, it will pass through

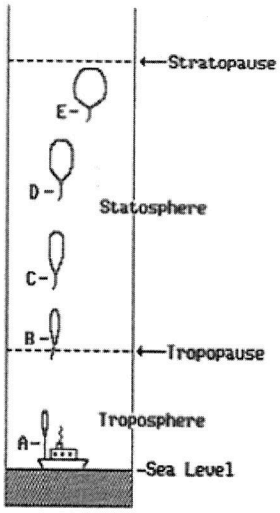


A) *W* and *X*, but not *Y* or *Z*
B) *W*, *X*, *Y*, and *Z*
C) *W*, but not *X*, *Y*, or *Z*
D) *W*, *X*, and *Y*, but not *Z*

20) As a volume of air expands due to heating, the density of this air will

A) remain the same
B) increase
C) decrease

21) The drawing below represents five positions of a balloon after being released from a ship. The drawings of the balloon are not to scale compared to the altitude distances, but are to scale with each other.

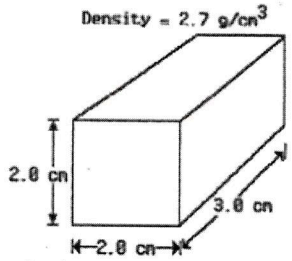


In order to make the balloon rise, the density of the gas put inside the balloon must be

A) less than the density of the air at sea level
B) more than the density of the air at sea level
C) the same as the density of the air at sea level

Questions 22 through 25 refer to the following:

The diagram below represents a solid material of uniform composition.



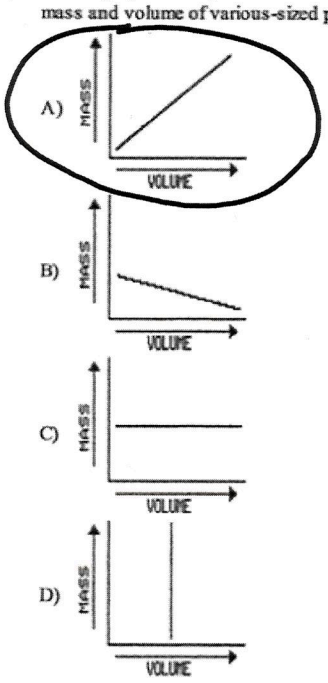
22) When this material is placed in a container of water, it sinks to the bottom of the container. Compared to the density of water, the density of the material is

A) less
B) the same
C) greater

23) If this material is heated and expands, the density of the material will

A) decrease
B) increase
C) remain the same

24) Which graph best represents the relationship between the mass and volume of various-sized pieces of this material?



25) The mass of this piece of material is approximately

A) 0.23 g
B) 4.4 g
C) 9.3 g
D) 32 g

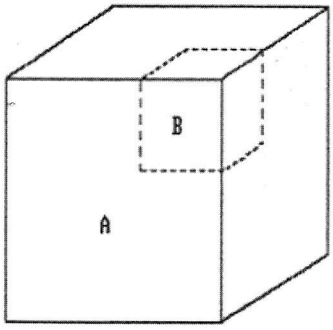
$M = D \cdot V$

$M = 2.7\,g/cm^3 \cdot 12\,cm^3$

$M = 32\,g$

Questions 26 through 30 refer to the following:

Object *A* below is a solid cube of uniform material having a mass of 65 grams and a volume of 25 cubic centimeters. Cube *B* is a part of cube *A*.



$D = \frac{M}{V}$

$D = \frac{65\,g}{25\,cm^3}$

$D = 2.6$

26) The mass of cube *B* is measured in order to calculate its density. The cube has water on it while its mass is being measured. How would the calculated value for density compare with actual density?

A) The calculated density value would be greater than the actual density.
B) The calculated density value would be the same as the actual density.
C) The calculated density value would be less than the actual density.

27) The density of cube *A* is

A) 2.6 g/cm^3
B) 0.38 g/cm^3
C) 3.8 g/cm^3
D) 0.26 g/cm^3

28) The density of the material in cube *A* is determined at different temperatures and phases of matter. At which temperature and in which phase of matter would the density of cube *A* most likely be *greatest*? [Assume a standard atmospheric pressure.]

A) at 200°C and in the solid phase
B) at 1800°C and in the liquid phase
C) at 20°C and in the solid phase
D) at 2700°C and in the gaseous phase

29) If cube *B* is removed from cube *A*, the density of the remaining part of cube *A* will

A) increase
B) remain the same
C) decrease

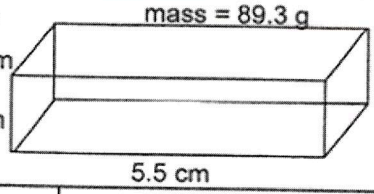
30) If pressure is applied to cube *A* until its volume is one-half of its original volume, its new density will be

A) one-half its original density
B) twice its original density
C) the same as its original density
D) one-third its original density

31. If a sample of cork has a mass of 15.0 grams and a volume of 22.3 cm^3, what is the density of the cork sample?

step 1: Write equation	step 2: Substitute w/units	step 3: Solve w/units
$D = \frac{M}{V}$	$D = \frac{15.0g}{22.3cm^3}$	$D = .67 g/cm^3$

32. What is the density of the iron bar shown below?



step 1: Write equation	step 2: Substitute w/units	step 3: Solve w/units
$D = \frac{m}{V}$	$\frac{89.3}{9.9}$	$9.0 g/cm^3$

33. If a sample of basalt has a density of 3.0 g/cm^3 and a volume of 168.3 cm^3 what is the mass of the basalt sample?

step 1: Write equation	step 2: Substitute w/units	step 3: Solve w/units
$M = D \times V$	$3.0 g/cm^3 \cdot 168.3 cm^3$	$504.9 g$