Topic I Review Questions – Set 1
ANSWERS and EXPLANATIONS

1. **(4) C,A,B** would be from largest to smallest volume

   Volume = lwh - Volume A = (2cm)(2cm)(2cm) = 8 cm^3
   Volume B = (3cm)(2cm)(1cm) = 6 cm^3
   Volume C is given = 12 cm^3

2. **(3) 3.0 g/cm^3** D = m/V D = 24g/8 cm^3 D = 3.0 g/cm^3

3. **(4)** This is the graph we have in our notes – the trend line looks the same. Mass and volume are directly proportional. Smaller samples of a substance have smaller masses and smaller volumes; larger samples have larger masses and larger volumes.

4. **(3) Weight** – this is just the definition – just memorize…

5. **(3) D,C,B,A** Decreasing density would mean from highest to lowest. Since items of higher density sink, D is most dense and A is least.

6. **(3) 3.0 cm** – The volume is 27cm^3, (l)(w)(h) = 27. Since it is a cube, each side must be the same length. The only measurement that would multiply out to a volume of 27cm^3 is 3 x 3 x 3.

7. **(2) – B -** Since all three shapes are the same material, their densities are all the same. Density can be calculated by using the formula D= m/V. Use any shape (I'll use the cube) to determine density. D= 81/27 = 3g/cm^3. Then pick a point on each line to determine the density of A, B, and C. The 30g/10cm^3 intersection shown on the B line indicates a density of 3.

8. **(3) 15 grams** - Basic graph reading. Go to 3 on the x-axis, go up hit the A line then go across.

9. 23. Manipulate the density formula or use the density triangle.

   Either way, you will end up with the formula – V = m / D

   V = m / D m = (76.5) (3) **V = 25.5 cm^3**

10. **(1) 6.0 g/cm^3** Pick any point on the line – pick something that works out well mathematically. Find the corresponding mass and volume and use the density formula →
    18/3 = 6 or 12/2 = 6 or even 9/1.5 = 6 any point should yield the same result.

    A mass of 18 g and the volume of 3 cm^3 is one of the easiest to work with:
    D = m / V D = 18g / 3 cm^3 D = 6 g/ cm^3

11. **(2) 2.7 g/cm^3** Find volume first by V=lwh (8cm)(8cm)(1cm) = 64cm^3 then use density formula
D = m/V D = 173g/64cm^3 D = 2.7g/cm^3

12. **(3) it is the same density as B**
It's still the same – different shapes of the same material have the same density.

13. **(2) sink**
Since the density of substance B (2.7g/cm^3) is greater than 1 g/mL (the density of liquid water), this substance would sink to the bottom.

14. **(2) decrease because gravitational pull decreases**
Weight is a measurement of the pull of gravity on a substance. On the Earth, weight is affected by an object's distance away from Earth's core. If the object is higher up above sea level (higher in the mountains), the object will have less gravitational force pulling on it, and therefore record a lower weight.

15. **(4) – the amount of matter in an object**
This is the standard definition of what mass is: the amount of matter in a substance.

16. **(1) – Distance**
Distance can be measured with a ruler. Density requires the formula D = m/V; Volume of a cube requires the formula v = l x w x h; Speed requires the formula distance/time.

17. **(3) – between liquids C and D**
A ball that has a density of 1.73 will stop between substances C and D. This is because C has a density of 1.21 and D is 2.34. This is just like the concept we talked about with the plastic fish staying between the clear liquid and the blue liquid in the soap dispenser.

18. **the same (2.7 g/cm^3)**
Each piece would still be 2.7 g/cm^3 – Since each piece is still aluminum, each piece will have the same density as the original (size does not affect density).

19. D = m/V D = 115.8 / 13.4 **D = 8.6 g/mL**

20. **6.7954** = 6.8 - the tenths place is one place to the right of the decimal

21. It's a two step process. First calculate the volume of the cube (length x width x height), and then the density (D = m / V).

since it is a cube, all 3 sides have the same value V = lwh V = (3)(3)(3) = 27 cm^3

D = m/V D = 65 / 27 **D = 2.4 g/cm^3**

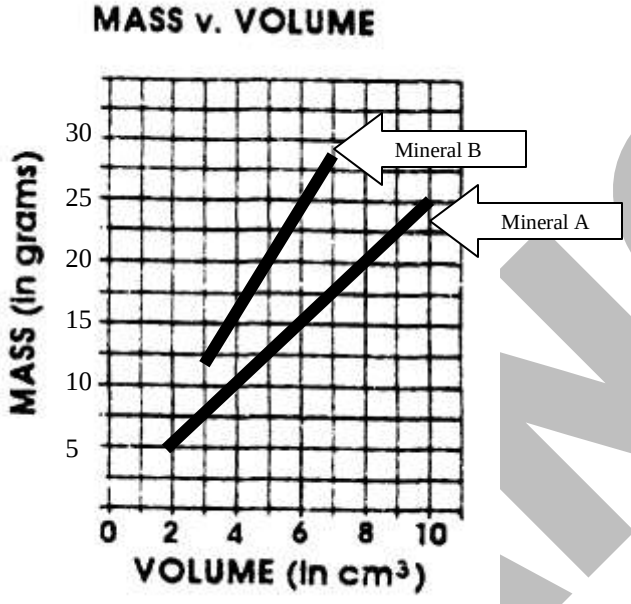
22. Manipulate the density formula or use the density triangle.

Either way, you will end up with the formula – m = D x V

m = D x V m = (7.1) (5) **m = 35.5 grams**

23. **A person weighs less on the Moon because the Moon's gravitational attraction on the object is less as a result of the Moon's smaller core.**

24-28.



24. A scale like the one shown in the graph above fits well. Each box is equal to 2.5 grams.

25 and 26. Plot and label the graph lines as shown in the graph above..

27. D = m/V D = 25 / 10 **D = 2.5 g/ cm^3**

28. D = m/V D = 28 / 7 **D = 4 g/ cm^3**