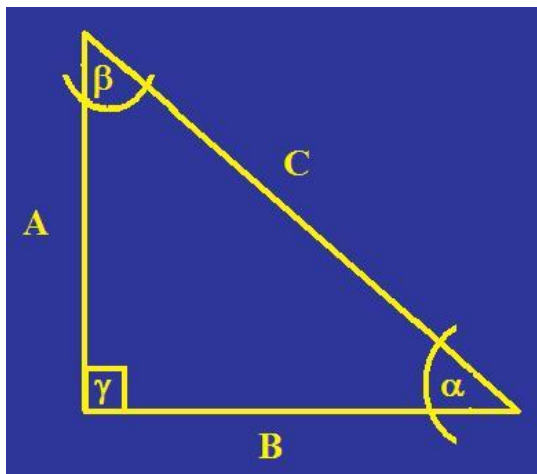


Worksheet #3 – CHEM 121 Fall 2015

Directions: Bring blank to class – the first 40 minutes you and your partner will work in this without your notes.

The next 10 minutes, you may use your notes. The remaining 25 minutes students will be randomly chosen to put their work on the board.



1. What is  $\sin \alpha$  (use the triangle at right)?
2. What is the  $\cos \alpha$  (use the triangle above right)?
3. What is the  $\sin \beta$  (use the triangle above right)?
4. What is the  $\cos \beta$  (use the triangle above right)?
5. If the length of side B is 3", and  $\alpha = 40^\circ$ , what is the length of side A (use the triangle above right)?

6. What is the anti-log of 120.303?

7. What is the anti-log of 101.456?

8. What is the anti-log of 199.852?

9. Briefly explain how you solved questions 6-8 with a non-programmable calculator.

10. What is the anti-ln of the values in questions 6-8?

11. To the alchemists, Au was the material representation of purity. It is a very soft metal that can be hammered into extremely thin sheets. If a 2 gram piece of gold ( $\rho = 19.32 \text{ g/cc}$ ) is hammered into a sheet whose area is 20 sq ft, what is the average thickness of the sheet **in mm**?

12. Label the following angle types:



13. What is the length of side C of the triangle for questions 1-5, using the Pythagorean Theorem?

14. Which rules of logarithms, below right, are incorrect and why?

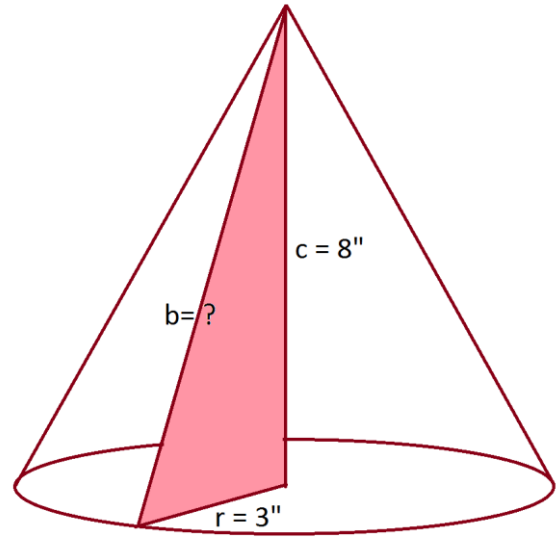
$$\log (x y) = \log x - \log y$$

$$\log \frac{x}{y} = \log x + \log y$$

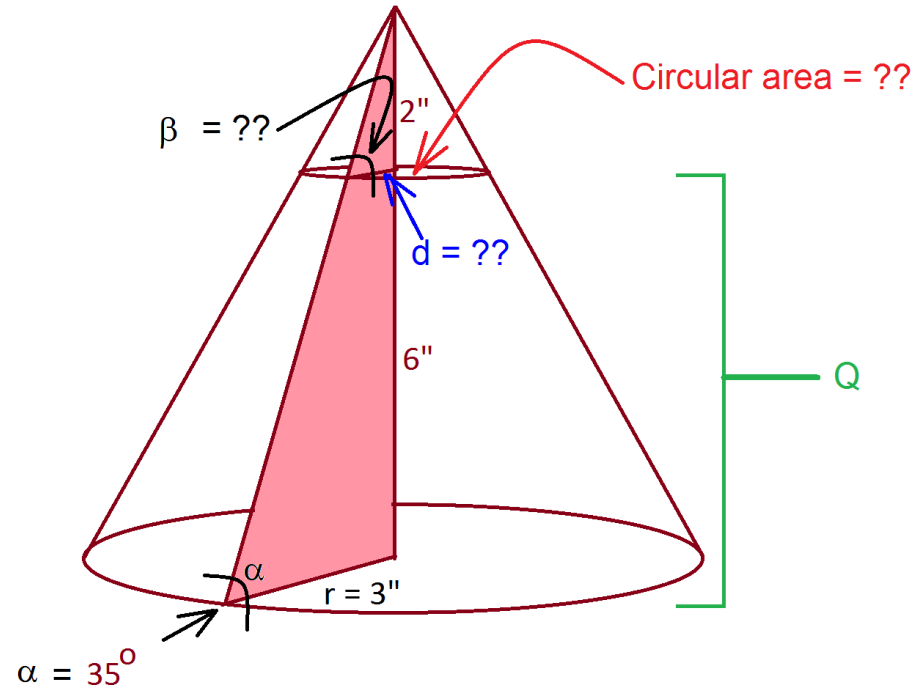
$$\log x^y = y \log x$$

$$\log \sqrt[y]{x} = \frac{\log x}{y}$$

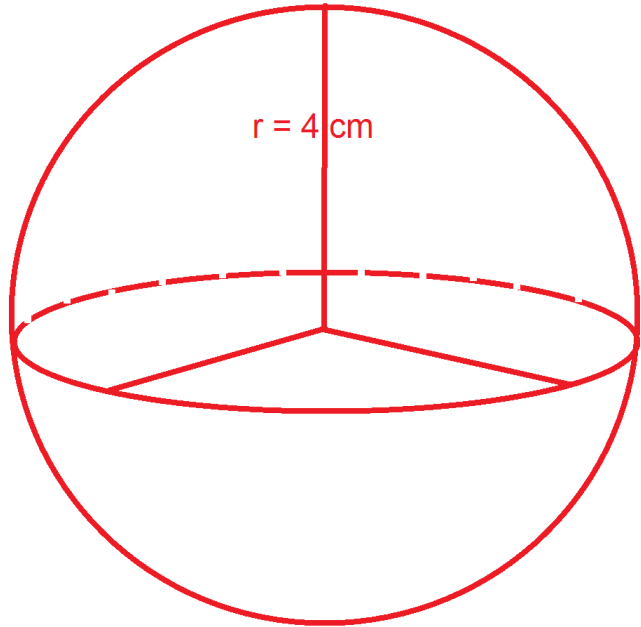
15. What is the surface area of the cone in the image?



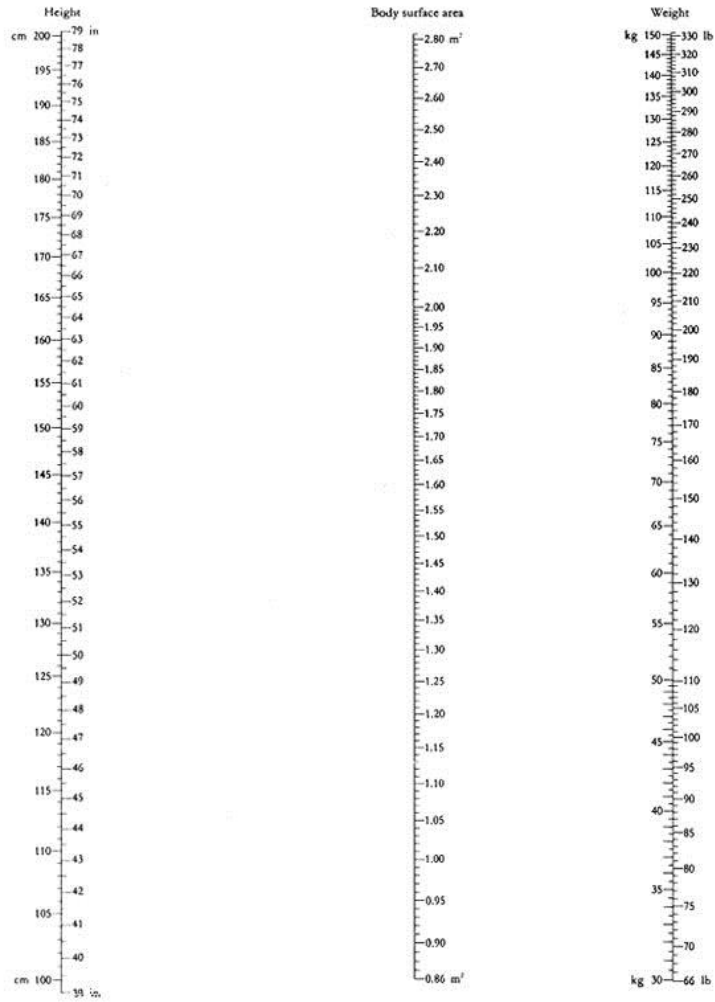
16. What is the surface area of the partial cone bracketed in green and labeled as "Q"?



17. The surface area of the sphere in the image is?



18. Using the nomogram at right, what is your BSA? Your partner's?



Nomogram for determination of body surface area from height and weight. (From Diem, K., and Lentner, C. [eds.]: Scientific Tables, 7th ed. Basle, Switzerland, CIBA-GEIGY, 1970, p. 537, with permission.)

19. One US quart is how many mL?

20. One US mile is how many nanometers?