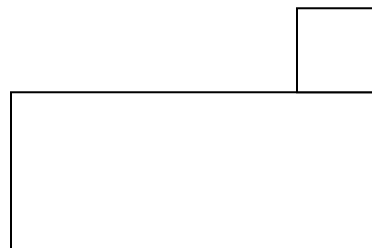


## CALCULATIONS HOMEWORK

1. A circular spa has a 12 foot diameter. What is the **surface area**?
2. A circular spa has a 12 foot diameter and a constant depth of 3.5 feet. What is the **water volume** of this spa?
3. A pool has a length of 105 feet and a width of 45 yards. What is the **surface area** of this pool?
4. A pool has a length of 46 feet, a width of 24 feet, a shallow depth of 4 feet and a deep depth of 8 feet. What is the **water volume** of this pool?
5. A pool has a length of 75 yards and a width of 50 feet. What is the **surface area** of this pool?
6. A pool has a length of 75 feet, a width of 50 feet, a shallow depth of 3.5 feet and a deep depth of 12 feet. What is the **water volume** of this rectangular pool?
7. Calculate the **Saturation Index** for water that has a Total Alkalinity of 100 ppm, a pH of 7.3, a calcium hardness of 250 ppm, a temperature of 67°F, and a total dissolved solids of 1500 ppm. If it is not balanced, fix it.
8. Calculate the **Saturation Index** for water that has a total alkalinity of 100 ppm, a pH of 8.2, a calcium hardness of 200 ppm, a temperature of 78°F, and a total dissolved solids of 500 ppm. If it is not balanced, fix it.
9. Calculate the **Saturation Index** for water that has a total alkalinity of 70 ppm, a pH of 7.2, a calcium hardness of 200 ppm, a temperature of 77°F, and a total dissolved solids of 500 ppm. If it is not balanced, fix it.
10. Adjust the **Alkalinity** from 70 ppm to 100 ppm in a 250,000 gallon pool using sodium bicarbonate.
11. An L-shaped pool is 175 feet long and 50 feet wide with a diving well 25 feet by 25 feet. How many **gallons of water** (water volume) are lost each week if this pool loses  $\frac{1}{4}$  inch per day due to evaporation and an additional 1 inch per week due to backwash and a leak?



## CALCULATIONS HOMEWORK

12. Adjust the **Calcium Hardness** from 75 ppm to 150 ppm in a 150,000 gallon pool. Use Calcium Chloride 77%.
13. How much **Cyanuric Acid** is needed to raise the stabilizer level in a 75,000 gallon pool from 0 to 30ppm?
14. How much **Calcium Hypochlorite** is needed to breakpoint chlorinate a 125,000 gallon pool if combined chlorine is 0.4 ppm, and free chlorine is 1.0 ppm?
15. An accidental fecal release occurs in a pool. The state health department requires raising the free chlorine level from 4 ppm to 20 ppm for 20 hours. How many gallons of **Sodium Hypochlorite** would be needed for a 80,000 gallon pool?
16. How much **Sodium Hypochlorite** would it take to put in 1ppm of chlorine in a 120,000 gallon pool?
17. A 3,500 gallon commercial spa has a flow rate of 150 gpm. What is the **turnover rate**?
18. What is the **flow rate** of a 3500 gallon spa based on a 30 minute turnover rate?
19. A D.E. filter has eight elements each measuring 2.5 feet long by 9 inches wide. What is the **surface area** of this filter?
20. A sand filter is 5 feet in diameter and 3 feet in depth. How much filter **surface area** does this filter have?
21. A 275,000 gallon pool needs to turn over the water every 8 hours. What **flow rate** is required for this turnover rate?
22. A pool with a sand filter system has a flow rate of 220 gpm and an optimal media flow rate of 12 gpm per square foot of filter medium. What is the required **filter area** to meet this need?