



Formula Sheet for Lab Analyst Exam

$$\text{Average (arithmetic mean)} = \frac{\text{Sum of All Terms}}{\text{Number of All Terms}}$$

$$\text{Average (geometric mean)} = [(X_1)(X_2)(X_3)(X_4)(X_n)]^{1/n} \text{ The } n\text{th root of the product of } n \text{ numbers}$$

$$\text{Biochemical Oxygen Demand (seeded), mg/L} = \frac{[(\text{Initial DO, mg/L}) - (\text{Final DO, mg/L}) - (\text{Seed Correction, mg/L})] [300 \text{ mL}]}{\text{Sample Volume, mL}}$$

$$\text{Biochemical Oxygen Demand (unseeded), mg/L} = \frac{[(\text{Initial DO, mg/L}) - (\text{Final DO, mg/L})] [300 \text{ mL}]}{\text{Sample Volume, mL}}$$

$$\text{Degrees Celsius} = \frac{(^{\circ}\text{F} - 32)}{1.8}$$

$$\text{Degrees Fahrenheit} = (^{\circ}\text{C}) (1.8) + 32$$

$$\text{Dilution or Two Normal Equation} = C_1 \times V_1 = C_2 \times V_2$$

Where C = Concentration, V = Volume or flow; Concentration units must match; Volume units must match

$$\text{Mass, lbs} = (\text{Volume, MG}) (\text{Concentration, mg/L}) (8.34 \text{ lbs/gal})$$

$$\text{Removal, \%} = \left[\frac{\text{In} - \text{Out}}{\text{In}} \right] \times 100$$

$$\text{Solids, mg/L} = \frac{(\text{Dry Solids, g})(1,000,000)}{\text{Sample Volume, mL}}$$

$$\text{Total Solids, \%} = \frac{(\text{Dried Weight, g}) - (\text{Tare Weight, g})}{(\text{Wet Weight, g}) - (\text{Tare Weight, g})} \times 100$$

$$\text{TSS, mg/L} = \frac{[(\text{mass of filter and solids after drying, g}) - (\text{mass of filter, g})] \times 1000 \text{ mL/L} \times 1000 \text{ mg/g}}{\text{mL of sample}}$$

$$\text{Volatile Solids, \%} = \frac{(\text{Dry Solids, g}) - (\text{Fixed Solids, g})}{(\text{Dry Solids, g})} \times 100$$

$$\text{VSS, mg/L} = \frac{[(\text{mass of filter and solids after drying, g}) - (\text{mass of filter and solids after ignition, g})] \times 1000 \text{ mL/L} \times 1000 \text{ mg/g}}{\text{mL of sample}}$$

Conversion Factors

1 cubic foot of water = 7.48 gallons

1 gallon (US) = 8.34 lb of water

1 gallon (US) = 3.785 L

1 pound = 0.454 kg