SUMMARY OF KEY WASTEWATER COLLECTION MATH FORMULAS

General:

1. **Mass, Lbs/Day = (Vol, MGD) x (Conc., mg/l) x (8.34 lbs/gal)**

   (BOD)/(SS), Lbs/Day = (Vol, MGD) x (SS, mg/l) x (8.34 lbs/gal)

2. **Dosage, mg/l = $\frac{\text{(Feed, lbs/day)}}{\text{(Vol, MGD) X (8.34 lbs/gal)}}$**

3. **Rectangular Tank Volume, cu. ft. = (Length, ft) x (Width, ft) x (Height, ft)**

   i) Vol, Gals = Multiply the above by the factor 7.48 gals/cu.ft.

4. **Right Cylinder Volume, cu. ft. = (0.785) x (D^2,ft) x (Height or Depth,ft)**

   i) Vol, Gals = Multiply the above by the factor 7.48 gals/cu.ft.

5. **Conical Base Volume, cu. ft. = $\frac{\text{(0.785) x } (D^2,\text{ft}) \text{ x (Height or Depth,ft)}}{3}$**

   i) Vol, Gals = Multiply the above by the factor 7.48 gals/cu.ft.

6. **Removal, Percent = $\frac{\text{(In - Out)}}{\text{In}}$ x 100**

7. **Decimal Fraction = $\frac{\text{(Percent)}}{100}$**

General (Continued):

8.	**Population Equivalent, BOD/TSS Lbs. Loading**	**=**	**(Population) x BOD or TSS, lbs/day/capita**
	a) Population Equivalent, No. of People	**=**	**(Vol, MGD) x (Conc., mg/l) x 8.34 lbs/gal) / (BOD or TSS, 0.17 lbs/day/capita)**
	b) Population Equivalent - BOD, mg/l	**=**	**(Population) x (BOD or TSS, lbs/day per capita) / (Flow, MGD) x (8.34 lbs/day)**
9.	**Daily Hydraulic Loading, GPD**	**=**	**(Population, No. of People) x (100 GPCD)**
	a) Population, No. of People	**=**	**(Daily Hydraulic Loading, GPD) / (100 GPCD)**

10. **Vol, gals** **=** **(GPM x 60 minutes/hour) x (Time, hours)**

11. **GPH** **=** **(Volume, gallons) / (Pumping Time, min. x 60 min/hour)**

12. **Time, Hours** **=** **(Volume, gallons) / (Pumping Rate, GPM x 60 min/hour)**

13. **Supply, Hrs (Full or Tank Dry)** **=** **(Storage Volume, Gallons) / (Flow In, GPM - Flow Out, GPM) x 60 Min/Hr.**

SUMMARY OF KEY WASTEWATER
COLLECTION MATH FORMULAS - Continued

Collection System Velocity:

1. Velocity:

$$Q,cfs = (Area,sq.ft.) \times (Velocity,fps)$$

The units in the formula letters are defined by the shape of pipeline or channel, as follows:

Round Pipeline

$$\frac{(GPM)}{(448.8\ GPM/cfs)} = (0.785) \times (D,ft)^2 \times \frac{(Distance, ft)}{(Time, sec.)}$$

Or . . .

Rectangular Channel

$$\frac{(GPM)}{(448.8\ GPM/cfs)} = (W, ft. \times H, ft.) \times \frac{(Distance, ft)}{(Time, sec.)}$$

2. Alternate Forms of the Basic Formula:

$$Q = (A) \times (V)$$

$$A = \frac{(Q)}{(V)}$$

$$V = \frac{(Q)}{(A)}$$

3. Flow Conversions:

a) Flow, GPM = (Q, cfs) X (448.8 GPM/cfs)

b) $$Q, cfs = \frac{(Flow, GPM)}{(448.8\ GPM/cfs)}$$

4. $$\text{Velocity, fps Between Manholes} = \frac{(Distance, ft.)}{(Time, seconds)}$$

SUMMARY OF KEY WASTEWATER COLLECTION MATH FORMULAS - Continued

Hydraulics:

1. Hydraulic (Water Column Height) Pressure :

i) PSI = $\frac{\text{(Head, ft.)}}{\text{2.31 ft./PSI}}$

ii) PSI = Head, ft. x 0. 433 PSI/ft.

Or,

iii) Head, ft. = PSI x 2.31 ft./PSI

iv) Head, ft = $\frac{\text{PSI}}{\text{0.433 PSI/ft.}}$

Pounds of Force On The Face of a Valve

2) Force, lbs = (Area, Sq. Inches) x PSI,

Or,

3) Force, lbs = (0.785)(D, ft.)^2 x 144 sq.in/sq.ft. x PSI.

Bottom Force and Buoyancy

Tank Bottom Forces:

Rectangular Basins

4) Force, lbs = L, ft x W,ft, x H, ft, x 62.4 lbs/cubic foot

Right Cylinders

5) Force, lbs = (0.785)(D, ft.)^2 x Height, ft. x 62.4 lbs/cu.ft.

Pounds Per Square Foot on a Tank Bottom:

Rectangular Basins

6) $\frac{\text{Force, lbs = L, ft x W,ft, x H, ft, x 62.4 lbs/cubic foot}}{\text{(Bottom Area, sq. ft.)}}$

Right Cylinders

7) $\frac{\text{Force, lbs = (0.785)(D, ft.)}^2\text{ x Height, ft. x 62.4 lbs/cu.ft.}}{\text{(Bottom Area, sq. ft.)}}$

Change of Direction

8. Force, lbs = 2 x [Area$_{\text{sq.in.}}$ x Pressure$_{\text{, Psi}}$] x (1/2 Sin Θ)
(Any Bend)

SUMMARY OF KEY WASTEWATER COLLECTION MATH FORMULAS - Continued

Pumps and Pumping:

1. Pumping: Rates:

a) Vol, gals = (GPM) x (Time, min)

b) Fill Rate, GPM = $\frac{\text{(Tank Volume, Gals)}}{\text{(Time, minutes)}}$

c) Fill Time, Minutes = $\frac{\text{(Tank Volume, Gals)}}{\text{(Fill Rate, GPM)}}$

2. Pump Size:

a) Water Hp. = $\frac{\text{(GPM) x (Head,ft)}}{\text{(3,960)}}$

b) Brake Hp. = $\frac{\text{(GPM) x (Head,ft)}}{\text{(3,960 x (\%, Effic.)}}$

3. Overall Efficiency, % = (Motor, % x Pump, %) x 100

4. Vol, GPM = (0.785) x (Bore,ft)^2 x (Stroke, ft.) x 7.48 x Strokes/min x %, Effic.

5. Cost/day = (Brake Hp.) x (0.746 Kw/Hp.) x Operating Time, Hrs. x $\frac{\text{(¢ /Kw- Hr.)}}{100}$

6. Speed, RPM (N_2) = $\frac{\text{(} N_1 \text{ x } D_1 \text{)}}{\text{(} D_2 \text{)}}$

Strength of Solutions:

1. Chemical Feed Pumps:

$$GPD = \frac{\text{(Required Feed, Lbs/Day)}}{\text{(Dry lbs/Gal)}} = \frac{\text{(MGD) x mg/L x 8.34}}{\text{(Dry lbs/Gal)}}$$

2. Chemical Feed Rate:

$$GPD = \frac{\text{(Feed, ml/minute x 1,440 min/day)}}{\text{(1,000 ml/L x 3.785 L/gallon)}}$$

$$ml/min = \frac{\text{(GPD x 1,000 ml/L x 3.785 L/Gallon)}}{\text{(1,440 min/day)}}$$

$$ml/min = \text{(GPM x 3,785 ml/gal)}$$

3. $$\text{Lbs/gallon} = \frac{\text{(\% Solution)}}{\text{(100)}} \text{ x 8.34 lbs/gallon}$$

4. Lbs Chemical = Specific Gravity x 8.34 lbs/gallons x Gallons of Solution

5. $$\text{Specific Gravity} = \frac{\text{(8.34 lbs/gallon + Chemical Wt., Lbs/gallon)}}{\text{(8.34 lbs/gallon)}}$$

6. Specific Gravity, Lbs/gallon = (S.G. x 8.34 lbs/gal) - (8.34 lbs/gal)

7. $$\text{\% Percent of Chemical in Solution from Dry Stock} = \frac{\text{(Dry Chemical, Lbs)}}{\text{(Dry Wt. Chemical, Lbs) + (Water, Lbs)}} \text{ x 100}$$

8. $$\text{Mixture Gals for Percentage (\%)} = \frac{\text{(Gals of Dilute Solution x Lower Concentration, \%)}}{\text{(Higher Concentration Solution, \%)}}$$

9. Two-Normal Equations:

a) $C_1V_1 = C_2V_2$

b) $\frac{Q_1}{V_1} = \frac{Q_2}{V_2}$

10. Three Normal equations:

a) $(Q_1C_1) + (Q_2C_2) = (Q_3C_3)$

b) $\frac{Q_1}{V_1} = \frac{Q_2}{V_2} = \frac{Q_3}{V_3}$

SUMMARY OF KEY WASTEWATER COLLECTION MATH FORMULAS - Continued

Sedimentation Tanks and Clarifiers:

Hydraulic Cross Check Formulas:

1. **Detention Time, Hrs.** = $\frac{\text{(Volume, gals) x (24 Hrs./day)}}{\text{(Total 24 Hr. Flow, gals/day)}}$

2. **Total Flow, GPD** = $\frac{\text{(Volume, gals) x (24 Hrs./day)}}{\text{(Detention Time, Hrs.)}}$

3. **Surface Loading Rate, GPD/sq ft.** = $\frac{\text{(Total Flow, GPD)}}{\text{(Surface Area, sq.ft.)}}$

4. **Weir Overflow Rate, GPD/LF** = $\frac{\text{(Flow, GPD)}}{\text{(Weir Length, ft)}}$

   i) **Weir Length, ft.** = **Circumference, ft.**

   = **(π x Diameter, ft.)**

5. **Solids Loading Rate, lbs/day/sq. ft.** = $\frac{\text{(Solids into Clarifier, lbs/day)}}{\text{(Surface Area, sq. ft.)}}$

6. **Sludge Solids, lbs** = **(Flow, Gals) x (8.34 lbs/gal) x (Sludge, %)**

7. **Raw Sludge Pumping, gpm** = $\frac{\text{(Settleable Solids, ml/L) x (Plant Flow, GPM)}}{\text{(1,000 mls/L)}}$

SUMMARY OF KEY WASTEWATER COLLECTION MATH FORMULAS - Continued

Ponds and Lagoons:

1. **Organic Loading Rate, Lbs/day/acre** = **(BOD In, lbs/day) / (Pond Area, acres)**

2. **Pond Area, Acres** = **(BOD In, Lbs/day) / (Organic Loading Rate, lbs/day/acre)**

3. **Detention Time, Days** = **(Volume, Acre-ft) / (Flow, Acre-ft/Day)**

4. **Surface Area, Acres (BOD Loading)** = **(Flow, MGD) x (BOD Conc. mg/l) x (8.34 lbs/gal) / (Loading Rate, Lbs/Acre/Day)**

5. **Hydraulic Loading Rate, Inches/day** = **(Pond Depth, Inches) / (Detention Time, Days)**

6. **Pond Depth, Ft.** = **(Daily Flow Into The Pond, Cu.ft.) / (Total Surface Area of the Pond, Sq.ft.)**

7. **Volume, Acre-Ft** = **(Area, acres) x (Depth, ft.)**

8. **Flow Rate, Acre-Ft/Day** = **(Daily Flow into Pond, GPD) / (7.48 Gal/cu.ft.) x (43,560 sq.ft/acre)**

Evaporation / Percolation Rates

9. **Inches/Day** = **(Volume lost, Gallons/Day) / (No. of Acres x 325,828 gals/Ac-ft) x (12"/ft)**

10. **Vol, Gals Lost/Day** = **(Acres, sq.ft.) x (Evap. Rate, inches/day) / (12") x 7.48 gals/cf**

SUMMARY OF KEY WASTEWATER COLLECTION MATH FORMULAS - Continued

Trickling Filters:

1. **Organic Loading Rate, Lbs/Day/1,000 cu.ft.** = $\frac{\text{BOD, Lbs/Day}}{\text{Media Volume, 1,000's of cu.ft.}}$

Same as . . . = $\frac{\text{MGD} \times \text{mg/L BOD} \times 8.34 \text{ lbs/gal}}{\text{Media Volume, 1,000's of cu.ft.}}$

2. **Hydraulic Loading Rate, GPM/sq.ft.** = $\frac{\text{GPM}}{\text{Surface Area, sq. ft.}}$

3. **Hydraulic Loading Rate, GPD/Sq. Ft.** = $\frac{\text{GPM} \times 1{,}440 \text{ min/day}}{\text{Surface Area, sq. ft.}}$

a) **Hydraulic Loading Rate, GPM/sq.ft.** = $\frac{\text{GPM}}{\text{Surface Area, sq. ft.}}$

4. **Recirculation Ratio** = $\frac{\text{Recirculation Flow, } Q_1}{\text{Average Influent Flow, } Q_2}$

5. **Total Flow** = **Recirculation Flow, Q_1) + (Average Influent Flow, Q_2)**

SUMMARY OF KEY WASTEWATER COLLECTION MATH FORMULAS - Continued

Rotating Biological Contactors:

1. Organic BOD Loading Rate, Lbs/Day/1,000 sq.ft. = **(Soluble BOD Applied, lbs BOD/Day) / (Media Surface Area/1,000 sq. ft.)**

2. Hydraulic Loading Rate, GPM/sq.ft. = **(GPM) / (Surface Area, sq. ft.)**

3. Hydraulic Loading Rate, GPD/sq.ft. = **(Total Flow, GPD) Including Recirculation / (Surface Area, sq.ft.)**

4. BOD Applied, Lbs/Day = **(Flow, MGD) x (Soluble BOD, mg/l) x (8.34 lbs/gal)**

5. Soluble BOD, mg/l = **Total BOD, mg/l - Suspended BOD, mg/l, or**

Soluble BOD, mg/l = **(Total BOD, mg/l) - (K x Suspended Solids, mg/l)**

6. Suspended BOD, mg/l = **K x Suspended Solids, mg/l**
(K = 0.5 - 0.7 for most domestic wastewaters.)

SUMMARY OF KEY WASTEWATER COLLECTION MATH FORMULAS - Continued

Oxidation Ditches:

1.	**F/M**	**=**	**(BOD, lbs/day) / (MLVSS, lbs)**
2.	**BOD Loading Rate, Lbs/Day/1,000 Cu. Ft.**	**=**	**(BOD, lbs/day) / (Ditch Volume, in 1,000 Cu. ft.)**
3.	**Ditch Detention Time, Hours**	**=**	**(Ditch Vol, MG) x 24 Hours/Day) / Flow, MGD**

4. Determine Sludge Age:

a) Aeration Solids, lbs. = **(Vol, MG) x (MLSS, mg/l) x (8.34 lbs/gal)**

b) Solids Added, lbs/day = **((Vol, MG) x (Inf. SS, mg/l) x (8.34 lbs/gal)**

c) Sludge Age, Days = **(Solids Under Aeration, lbs) / Solids Added, lbs/day**

5. Calculate Ditch Volume:

a) Average Width, ft. = **(Bottom, ft.) + (Depth, ft) / (Slope)**

b) Area Determination

i) Area, sq. ft. = **Width, ft x Depth, Ft., or**

ii Area, sq. ft. = $\frac{(B,Width_1, ft. + T,Width_2, ft.)}{(2)}$

c) End Lengths, ft. = **(2 π) x Radius, ft.**

d) Total Length, ft. = **Ends Lengths, ft + (2 Lengths, ft.)**

e) Volume, cu. ft. = **(Length, ft.) x (Area, sq. ft.)**

SUMMARY OF KEY WASTEWATER
COLLECTION MATH FORMULAS - Continued

Activated Sludge:

1. F/M RATIO = (BOD in Primary Effluent, lbs/day) / (Lbs of Mixed liquor VSS in the Aeration Tanks)

2. Mean Cell Residence Time, Days, (MCRT) = (Aeration Tank TSS, lbs + Clarifier TSS, lbs) / (TSS Wasted, lbs/day + Effluent TSS, lbs/day)

a) TSS Wasted, = (Aer. Tnk TSS,lbs) + (Clar.TSS, lbs) - Effluent TSS, Lbs / (MCRT, Days)

b) MCRT, Days = (Aeration Tank TSS, lbs) + (RAS, Lbs) / (TSS Wasted, lbs + Effluent TSS, lbs)

3. Sludge Volume Index (SVI), ml/g = (Settled Volume, ml/L) x (1,000 Mg/G) / (MLSS, Mg/L)

MLSS, mg/l = (1,000,000) / SVI

4. Sludge Density Index (SDI) = (100) / SVI

5. Sludge to Waste, lbs/day = (Secondary SS, lbs) - Effluent SS, lbs/day / (MCRT, days)

6. Sludge Age, Days = (Aeration Tank TSS, lbs) / (Primary Clarifer Effluent TSS, lbs/day) (Refer to MCRT)

7. Return Sludge Rate, MGD = (Aerator Flow, MGD) x (Settable Solids, %)

8. Desired MLSS, mg/l = (Desired MLSS in Aerator, lbs.) / (Aerator Vol., MG) x (8.34 lbs/gal)

9. Cu.ft. Air/ Lb. BOD Removed = (Air, Cu.ft.) / (Primary Effl., lbs BOD - Secondary Effl., lbs. BOD)

SUMMARY OF KEY WASTEWATER COLLECTION MATH FORMULAS - Continued

Anaerobic Digesters:

1.	**Volatile Solids Loading, Lbs VS/Day/Cu.Ft.**	**=**	**(Feed Sludge VS, lbs/day) / (Digester Volume, cu.ft.)**
2.	**Detention Time, Days**	**=**	**(Digester Volume, Gallons) / (Sludge Feed, GPD)**
3.	**Digester Loading, Lbs Vol. Matter/ Cu. Ft./day**	**=**	**(Lbs of Volatile Matter Added/Day) / (Volume of Digester, Cu. Ft.)**

4. Volatile Solids Reduced, % = **(VS In - VS Out) / (VS In) - (VS, In x VS, Out) x 100**

5. Gas Production, Cu.Ft./lb VS Reduced = **(Gas Produced, cu.ft./day) / (VS Feed, lbs/day) x (Reduction/100)**

6. Gas, Lbs = **Volatile Solids, lbs x % Reduction of Volatile Matter**

7. VA/Alk Ratio = **(Volatile Acids, mg/L) / (Alkalinity, mg/L)**

8. Volatile Matter Destroyed, lbs/day/cu.ft. = **Sludge Pumped, gals/day x % Solids x % Volatile x % Reduction x 8.34 lbs/gal / (Digester Volume, cu. ft.)**

9. Pumping, Minutes = **(Flow, MGD) x (Inf. SS, mg/L - Effl, SS, mg/L) x 100% / (Pump, GPM) x (Sludge Solids, % x (24 Hours/day)**

10. V.S. Destroyed, Lbs/day/cu. ft. = **(VS Added, lbs/day)(VS Reduction, %) / (Disgester Volume, Cu. ft. ÷ 100%)**

11. Digested Sludge in Storage, Lbs. = **(VS Added, lbs/day) x (Loading, Lbs Digester Sludge) / (Lbs VS / Day)**

12. Volatile Solids, Lbs = **(Dry Solids, lbs) x (Raw Sludge, % VS) / (100 %)**

SUMMARY OF KEY WASTEWATER COLLECTION MATH FORMULAS - Continued

Tertiary Filtration:

1. Filter Flow Rate:

Filtration Rate, GPM = (Filter Area,sq.ft.) x (GPM/sq.ft.)

2. Filter Backwash:

Backwash, gals = (Filter Area,sq.ft.) x (Backwash Rate, gpm) x (Time, min)

$$\text{Backwash Rate, gpm/sq.ft.} = \frac{\text{Backwash Volume, gpm}}{\text{Filter Area, sq.ft.}}$$

Backwash,gals = (Filter Area, sq.ft.) x (Rise/Fall,ft/min) x (7.48 gals/cu.ft.)

SUMMARY OF KEY WASTEWATER COLLECTION MATH FORMULAS - Continued

Land Application:

1. Required Acres = $\frac{\text{(Total Volume of sludge, tons/year)}}{\text{(Limit, tons per acre)}}$

2. Sludge Application, Lbs. = (Gal. of Sludge) x (8.34 lbs/gal) x (% Solids in Sludge)

Waterways Discharge:

1. Diluted Concentration, mg/l or µg/l = $\frac{\text{(Stream Conc. 1 x Stream, } Q_1 \text{) + (Waste Conc. 2 x Waste, } Q_2 \text{)}}{\text{(Stream } Q_1 \text{ + Waste } Q_2 \text{)}}$

2. Lbs O_2/Day = (Flow, MGD) x (Conc. O_2, mg/l) x (8.34 lbs/gal)

SUMMARY OF KEY WASTEWATER COLLECTION MATH FORMULAS - Continued

Effluent Disinfection

Gas Chlorine Feed, Lbs/day

1. Lbs/Day = (Vol, MGD) x (Conc., mg/l) x (8.34 lbs/gal)

$$\text{Dosage, mg/l} = \frac{(\ \text{Lbs/day}\ )}{(\ \text{MGD}\ ) \times (\ 8.34\ \text{lbs/gal}\ )}$$

65% HTH Feed, Lbs/day - Calcium Hypochlorite

2. HTH, lbs/Day $= \dfrac{\text{(Vol, MGD) x (Conc., mg/l) x (8.34 lbs/gal)}}{0.65}$

$$\text{Dosage, mg/l} = \frac{(\ \text{Lbs/day x } 0.65\ )}{(\ \text{MGD}\ ) \times (\ 8.34\ \text{lbs/gal}\ )}$$

$$\text{HTH, Lbs} = \frac{(\ \text{Gals, } H_2O \text{ x } 8.34\ \text{lbs/gal x \% Solution}\ )}{(\ 0.65\ )}$$

5-1/4% Liquid Chlorine - Sodium Hypochlorite

3. Lbs/Gal $= \dfrac{(\ \text{Solution Percentage}\ )}{100} \times 8.34\ \text{lbs/gal}$

$$\text{GPD} = \frac{\text{(Vol, MGD) x (Conc., mg/l) x (8.34 lbs/gal)}}{(\ \text{Lbs/gal}\ )}$$

Dosage/Demand/Residual

4. Dosage, mg/l = (Demand, mg/l) + (Residual, mg/l)

5. Demand, mg/l = (Dosage, mg/l) - (Residual, mg/l)

6. Residual, mg/l = (Dosage, mg/l) - (Demand, mg/l)

7. Sulphur Dioxide:

Lbs/day = (MGD) x (Cl_2 Residual, mg/l) x (8.34 lbs/gal) x 0.90

0.9 mg/l of SO_2 is required to dechlorinate 1.0 mg/l of chlorine.

SUMMARY OF KEY WASTEWATER COLLECTION MATH FORMULAS - Continued

Slope and Grade

1.	**Percent (%) Slope**	**=**	$\frac{\text{(Rise, Ft)}}{\text{(Run, Ft)}} \times 100$
2.	**Elevation, ft.**	**=**	**(Grade %) x (Run, ft.)**
3.	**Distance, ft.**	**=**	**(Station #2 - Station #1) x 100**
4.	**Elevation, ft.**	**=**	**(MH #1, ft.) - [Slope x Run, ft.]**
5.	**Grade, %**	**=**	$\frac{\text{(Elev. ft.\#1 - Elev. ft. \#2)}}{\text{(Run, ft.)}} \times 100$

SUMMARY OF KEY WASTEWATER COLLECTION MATH FORMULAS - Continued

Laboratory:

1. **BOD, mg/l** = $\frac{\text{(Initial DO, mg/l - Final DO, mg/l)}}{\text{(Sample Vol, ml ÷ Bottle Vol, ml)}}$

BOD, mg/l = **(Initial DO, mg/l - Final DO, mg/l) x Dilution Factor**

mg/l = $\frac{\text{(ml x 1,000,000)}}{\text{(ml of Sample)}}$

mg/l = **ml x 1,000 ml/L**

2. **TSS (mg/l)** = $\frac{\text{Paper Wt. and Dried Solids(g) - Paper Wt.(g)}}{\text{(Milliliters [ml] of Sample)}}$ **x 1,000,000**

3. **BOD (mg/l) (Unseeded)** = $\frac{\text{(Initial D.O. - Final (D.O.) x 300 ml}}{\text{(Milliliters [ml] of Sample)}}$

4. **mg/l Total Solids** = $\frac{\text{(Residue, mg) x 1,000}}{\text{(ml sample)}}$

5. **%, Solids** = $\frac{\text{(MLSS)}}{\text{(10,000 mg/L per 1%)}}$

6. **Geometric Mean** = $(X_1 \bullet X_2 \bullet X_3 \bullet \ldots X_n)^{1/n}$

7. **Temperature:**

F° = **(C° x 1.8) + 32°**

C° = $\frac{\text{(F° - 32°)}}{\text{(1.8)}}$

END