CONVERSION FACTORS - CANADIAN ABC EXAMINATION

On the left hand column of the table are the SI (Systeme International d'Unites). To convert from metric units to imperial units, simply multiply by the conversion factor in the upper portion of each cell To convert from the Imperial units to metric units, simply multiply by the conversion factor in the lower portion of each cell. The arrows next to each conversion factor show the direction of the conversions.

Length		
mm	x 0.039 37 →	inches
	←x 25.4	
mm	x 3.28 x 10^{-3} →	feet
	←x 304.8	
cm	x 0.393 7 →	inches
	←x 2.54	
cm	x 0.032 8 →	feet
	←x 30.48	
m	x 39.37 →	inches
	←x 0.025 4	
m	x 3.281 →	feet
	←x 0.304 8	
km	x 3 280.84 →	feet
	←0.3048 x 10^{-3}	
km	x 1 093.61 →	yards
	← x 9.144 x 10^{-4}	
km	x 0.621 4 →	miles
	←x 1.609	

Weight / Mass		
g	x 2.205 x 10^{-3} →	pounds
	←x 453.59	
g	x 15.432 3 →	grains
	←x 0.064 799	
g	x 0.035 27 →	ounces
	←x 28.349 5	
mg	x 2.205 x 1 0^{-6} →	pounds
	←x 453 592.3	
mg	x 0.015 43 →	grains
	←x 64.799	
kg	x 2.204 6 →	pounds
	←x 0.4536	

Temperature		
^{0}C	(1.8 x ^{0}C) + 32 = ^{0}F →	^{0}F
	←^{0}C = (^{0}F-32) x 0.5556	

Area & Volume		
m^2	x 10.763 9 →	square feet
	←x 0.092 9	
m^2	x 1.196 →	square yards
	←x 0.836 1	
m^2	x 2.471 x 10^{-4} →	acres
	←x 4046.9	
ha	x 2.471 →	acres
	←x 0.404 69	
cm^3	x 0.061 024 →	cubic inches
	←x 16.387	
m^3	x 35.315 →	cubic feet
	←x 0.028 32	
m^3	x 219.9 →	Imperial gallons
	←x 4.546 x 10^{-3}	
L	x 0.2199 →	Imperial gallons
	←x 4.546	
mL	x 0.000219 →	Imperial gallons
	←x 0.434 6 x 10^{-5}	
m^3	x 0.2199 x 10^{-3} →	Million Imp. gallons
	←x 4.546 x 10^3	
US gallons	x 0.832 7 →	Imperial gallons
	←x 1.2001	

Work / Energy & Power		
J	x 0.737 6 →	foot pounds
	←x 1.356	
kJ	x 0.947 8 →	BTU
	←x 1.055	
kW	x 1.341 →	hp (electric)
	←x 0.745 7	

Pressure		
Pa	x 0.145 x 10^{-3} →	pounds per square inch
	←x 6.895 x 1 0^3	
kPa	x 0.145 →	pounds per square inch
	←x 6.895	
kPa	x 4.014 5 →	inches of water column
	←x 0.249	
kPa	x 0.295 →	inches of mercury col.
	←x 3.386	
psi	x 2.31 →	Feet of water depth
	←x 0.433	

Flow Rate (volume / time)			Rates		
L/s	x 13.198 5 →	gallons (Imperial) per minute	kg/h	x 2.205 →	pounds per hour
	←x 0.075 84			←x 0.453 6	
L/s	x 0.035 3 →	cubic feet per second	kg/d	x 2.205 →	pounds per day
	←x 28.316			←x 0.453 6	
L/s	x 2.118 9 →	cubic feet per minute	g/m² Xs	x 17.70 →	pounds per day per square foot
	←x 0.471 9			←x 0.056 51	
L/s	x 127.134 →	cubic feet per hour	kg/m² Xh	x 4.883 →	pounds per hour per square foot
	←x 7.865 x 10^{-3}			←x 0.204 8	
L/s	x 0.019 →	million gallons (Imperial) per day	kg/m² Xd	x 0.204 8 →	pounds per square foo per day
	←x 52.616			←x 4.883	
L/d	x 0.219 975 →	gallons (Imperial) per day	kg/ha Xd	x 0.892 2 →	pounds per acre per day
	←x 4.545 9			←x 1.121	
ML/d	x 0.219 975 →	million gallons (Imperial) per day	kg/ha Xy	x 0.892 2 →	pounds per acre per year
	←x 4.545 9			←x 1.121	
m^3/d	x 219.975 →	gallons (Imperial) per day	kg/m^3 Xd	x 0.062 43 →	pounds per cubic foot per day
	←x 4.545 9 x 10^{-3}			←x 10.02	
m^3/d	x 0.219 97 x 10^{-3} →	million gallons (Imperial) per day	m/h	x 3.281 →	feet per hour
	←x 4.545 9 x 10^3			←x 0.304 8	
m^3/s	x 19.005 6 →	million gallons (Imperial) per day	m^3/m² Xh	x 3.281 →	gallons (Imperial) per day per square foot
	←x 0.052 616			←x 2.0385 x 10^{-3}	
m^3/s	x 2 119 →	cubic feet per minute	m^3/m² Xh	x 20.441 5 →	cubic feet per hour pe square foot
	←x 4.719 x 10^{-4}			←x 0.304 8	
m^3/s	x 35.315 →	cubic feet per second	m^3/m² Xd	x 16.02 →	gallons (Imperial) per day per square foot
	←x 0.283 2			←x 0.048 92	
10^3 X m^3/d	x 490.596 →	million gallons (Imperial) per day	m^3/kg	x 35.315 →	cubic feet per pound
	←x 4.545 9			←x 0.062 43	
m^3/min	x 17.70 →	cubic feet per minute			
	← x 0.028 32				
L/min	x 0.219 975 →	gallons (Imperial) per minute			
	← x 4.550 4				

AREAS

Triangle Area = 1/2 BxH B = length of base H = height of triangle	Rectangle Area = L x W L = length of rectangle W = width of rectangle
Circle Area = πR^2 or $\frac{\pi D^2}{4}$	π = 3.1416 R = radius D = diameter

VOLUMES

Rectangular tank Volume = area of base x H or V = L x W x H	L = length of rectangle W = width of rectangle H = height of rectangle
Cylindrical tank Volume = area of base x H or V = πR^2 x H or V = $\frac{\pi D^2}{4}$ x H	R = radius of base D = diameter of base H = height of cylinder
Cone Volume = 1/3 area of base x H or V = 1/3πR^2 x H or V = 1/3π $\frac{D^2}{4}$ x H = $\frac{1}{12}\pi D^2$ x H	R = radius of base D = diameter of base H = height of cone from base to apex
Prism Volume = 1/2 area of rectangular base x H or V = 2 L x W x H	L = length of rectangular base W = width of rectangular base H = height from base to apex
Sphere (ball) Volume = $\frac{4\pi R^3}{3}$ or V = $\frac{4}{3}\pi$ $\frac{D^3}{8}$ = $\frac{1}{6}\pi D^3$	R = radius of sphere D = diameter of sphere

RATE OF FLOW

Rate of flow = W x D x V (m^3/s)	W = width of channel (m) D = depth of liquid in channel (m) V = velocity of the flow (m/s)
PIPE: Rate of flow = A x V (m^3/s)	A = cross sectional area (m^2) $A = \pi R^2$ V = velocity (m/s)

DETENTION TIME

Detention Time (hours) = $\frac{VT}{Q \times 3600}$	VT = volume of tank (m^3) Q = rate of flow (m^3/s)

OVERFLOW RATE

Weir Overflow rate = $\frac{Q}{WL}$ (L/sXm)	Q = rate of flow (L/s) WL = weir length (m) Circumference of a circle = 2πR

EFFICIENCY

Overall Efficiency (%) = $\frac{\text{Output} \times 100}{\text{Input}}$ Treatment Efficiency (%) = $\frac{(Ci - Ce) \times 100}{Ci}$	Ci = concentration in the influent Ce = concentration in the effluent

CHLORINATION

Chlorine Dosage = Chlorine Demand + Chlorine Residual

RATE OF CHLORINE DOSAGE

CD(mg/L) = $\frac{C\ (kg) \times 1000}{V\ (m^3)}$ OR CD(mg/L) = $\frac{C\ (kg)}{V\ (ML)}$	CD = rate of chlorine applied (mg/L) C = weight of chlorine added (kg) V = volume of water treated (m^3 or ML depending on formula used)

FILTER LOADING RATE

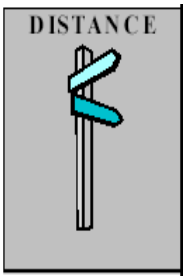
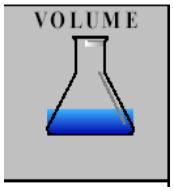
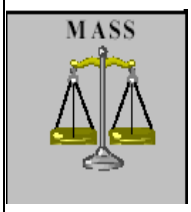
Filter Loading Rate = $\frac{Q\ (m^3/d) \times 0.0116}{A}$ (L/m^2Xs) Note: If flow rate Q is in L/s then the equation is: Filter Loading Rate = $\frac{Q\ (L/s)}{A}$	Q = flow rate (m^3/d) A = surface area of the filter (m^2)

FILTER BACKWASH RATE

Method 1. Filter Backwash Rate = $\frac{Q}{A}$ (L/m^2Xs) Method 2. Filter Backwash Rate = $\frac{R}{T}$ (m/h)	Q = rate of upflow of backwash water (L/s) A = surface area of filter (m^2) R = water rise (m) T = time (h)

CHEMICAL FEEDING

Chemical Feed Rate = $\frac{D \times Q}{c \times d \times 1440}$ (ml/min)	D = chemical dosage (mg/L) Q = flow rate (m^3/d) c = % active chemical expressed as a decimal d = relative density of chemical feed (g/cm^3)

CONVERSION CHART			
	Known	**To Determine**	**Method**
	mm	cm	÷ 10
	mm	m	÷ 1000
	cm	m	÷ 100
	m	km	÷ 1000
	km	m	× 1000
	m	cm	× 100
	m	mm	× 1000
	cm	mm	× 10
	ml	L	÷ 1000
	L	m^3	÷ 1000
	m^3	ML	÷ 1000
	ML	m^3	× 1000
	m^3	L	× 1000
	L	ml	× 1000
	mg	g	÷ 1000
	g	kg	÷ 1000
	kg	tonnes	÷ 1000
	tonnes	kg	× 1000
	kg	g	× 1000
	g	mg	× 1000
TIME	sec	min	÷ 60
	min	hr	÷ 60
	hr	day	÷ 24
	min	day	÷ 1440
	day	hr	× 24
	hr	min	× 60
	min	sec	× 60
	day	min	× 1440