

Appendix G

Features

Conversion Charts for:

- Length
- Area
- Volume
- Inertia
- Torque
- Force

Table G.1: Length Conversions

	mm	cm	m	in	ft	yd	km	mile
mm	1							
cm	10	10 ⁻¹						
m	1000	1	10 ⁻³	3.937 x 10 ⁻²	3.280 x 10 ⁻³	1.093 x 10 ⁻³	10 ⁻⁶	3.213 x 10 ⁻⁷
in	25.4	2.54	2.54 x 10 ⁻²	1	8.333 x 10 ⁻²	2.777 x 10 ⁻²	2.54 x 10 ⁻⁵	1.578 x 10 ⁻⁶
ft	304.8	30.48	3.048 x 10 ⁻¹	12	1	3.333 x 10 ⁻¹	3.048 x 10 ⁻⁴	1.893 x 10 ⁻⁴
yd	914.4	91.44	9.144 x 10 ⁻¹	36	3	1	9.144 x 10 ⁻⁴	5.681 x 10 ⁻⁴
km	10 ⁶	10 ⁵	1000	39370.1	3280.84	1093.61	1	6.213 x 10 ⁻¹
mile	1.609 x 10 ⁶	160934	1609.34	63360	5280	1760	1.609	1

Table G.2: Area Conversions

	cm ²	m ²	are	hectare	km ²	in ²	ft ²	yd ²	mile ²	acre
cm ²	1									
m ²	10000	10 ⁻⁴								
are	10 ⁶	10 ⁻²	10 ⁻⁶	10 ⁻⁸	10 ⁻¹⁰	1.55 x 10 ⁻¹	1.076 x 10 ⁻³	1.196 x 10 ⁻⁴	3.861 x 10 ⁻¹¹	2.471 x 10 ⁻⁶
hectare	10 ⁸	10 ⁻⁴	10 ⁻²	1	10 ⁻²	1550	10.7639	1.19599	3.861 x 10 ⁻⁷	2.471 x 10 ⁻²
km ²	10 ¹⁰	1	100	100	1	155000	1076.36	119.599	3.861 x 10 ⁻⁶	2.471 x 10 ⁻²
in ²	6.4516	6.4516 x 10 ⁻⁴	6.4516 x 10 ⁻⁶	6.4516 x 10 ⁻⁸	6.4516 x 10 ⁻¹⁰	1.55 x 10 ⁷	107639	11959.9	3.861 x 10 ⁻³	2.471 x 10 ⁻²
ft ²	929.03	9.2903 x 10 ⁻²	9.2903 x 10 ⁻⁴	9.2903 x 10 ⁻⁶	9.2903 x 10 ⁻⁸	1.55 x 10 ⁹	1.076 x 10 ⁷	1.196 x 10 ⁶	3.861 x 10 ⁻¹	2.471 x 10 ⁻²
yd ²	8361.27	8.36127 x 10 ⁶	8.36127 x 10 ⁻³	8.36127 x 10 ⁻⁵	8.36127 x 10 ⁻⁷	1	6.944 x 10 ⁻³	7.716 x 10 ⁻²	2.491 x 10 ⁻¹⁰	1.594 x 10 ⁻⁷
mile ²	2589 x 10 ¹⁰	2.589 x 10 ⁶	25899.9	258.999	2.58999	1296	1	1	3.587 x 10 ⁻⁹	2.295 x 10 ⁻⁶
acre	4.046 x 10 ⁷	4046.86	40.4686	4.04686 x 10 ⁻¹	4.04686 x 10 ⁻³	4.014 x 10 ⁶	2.787 x 10 ⁷	2.0976 x 10 ⁶	3.228 x 10 ⁻¹	2.066 x 10 ⁻⁴
						6.272 x 10 ⁶	43560	4840	15625 x 10 ⁻³	640
										1

Table G.3: Volume Conversions

	cm ³	dm ³ (= litre)	in ³	ft ³	yd ³	US fl oz	US gal	imp fl oz	imp gal	imp pint
cm ³	1									
dm ³ (= litre)	1000	1								
in ³	16.3871	1.638 x 10 ⁻²	6.102 x 10 ⁻²	3.531 x 10 ⁻⁵	1.308 x 10 ⁻⁶	3.3814 x 10 ⁻²	3.519 x 10 ⁻²	2.641 x 10 ⁻⁴	2.199 x 10 ⁻⁴	1.759 x 10 ⁻³
ft ³	28316.8	28.3168	1728	1	1.308 x 10 ⁻³	33.814	35.1951	2.641 x 10 ⁻¹	2.199 x 10 ⁻¹	1.75975
yd ³	764555	764.555	46656	27	2.143 x 10 ⁻⁵	5.541 x 10 ⁻¹	5.767 x 10 ⁻¹	4.329 x 10 ⁻³	3.604 x 10 ⁻³	2.883 x 10 ⁻²
US fl oz	29.5735	2.957 x 10 ⁻²	1.80469	1.044 x 10 ⁻³	3.7037 x 10 ⁻²	957.506	9960614	7.48052	6.22884	49.8307
imp fl oz	28.4131	2.841 x 10 ⁻²	1.73387	1.003 x 10 ⁻³	3.716 x 10 ⁻⁵	25852.7	26.908.6	201.974	168.179	1345.43
US gal	3785.41	3.78541	231	1.386 x 10 ⁻¹	3.716 x 10 ⁻³	1	1	7.5060 x 10 ⁻³	6.25 x 10 ⁻³	5 x 10 ⁻²
imp gal	4546.09	4.54609	277.149	1.605 x 10 ⁻¹	4.951 x 10 ⁻³	128	133.225	1	8.325 x 10 ⁻¹	6.66139
imp pint	568.261	5.682 x 10 ⁻¹	34.6774	2.068 x 10 ⁻²	7.432 x 10 ⁻⁴	153.772	160	1.20095	1	8
						19.2152	20	1.501 x 10 ⁻¹	1.25 x 10 ⁻¹	1

Table G.4: Inertia Conversions

	kg cm ²	kg m ²	kg m ²	kp cm ²	kp m ²	oz in ²	oz in ²	oz in ²	lb in ²	lb in ²	lb ft ²	lb ft ²
kg cm ²	1											
kp cm ²	980.665											
kg m ²	10 ⁻⁴	1.019 x 10 ⁻³	1.019 x 10 ⁻⁵	1.019 x 10 ⁻⁵	1.019 x 10 ⁻³	5.46748	5.46748	1.416 x 10 ⁻²	3.417 x 10 ⁻¹	8.850 x 10 ⁻⁴	2.373 x 10 ⁻³	7.375 x 10 ⁻⁶
kp m ²	10 ⁻¹	9.806 x 10 ⁻¹²	1.019 x 10 ⁻¹	1.019 x 10 ⁻¹	1.019 x 10 ⁻¹	5361.76	5361.76	13.8874	335.11	8.679 x 10 ⁻¹	2.32715	7.233 x 10 ⁻²
oz in ²	10 ⁻⁴	1.019 x 10 ⁻³	1.019 x 10 ⁻⁵	1.019 x 10 ⁻⁵	1.019 x 10 ⁻³	54674.8	54674.8	141.612	3417.17	8.85075	23.7304	7.375 x 10 ⁻¹
lb in ²	98066.5											
oz in ²	1.829 x 10 ⁻¹	1.865 x 10 ⁻⁴	1.865 x 10 ⁻⁶	1.865 x 10 ⁻⁶	1.865 x 10 ⁻⁴	536176	536176	1388.74	33.511	86.7962	232.715	7.375 x 10 ¹
lb in ²	70.8155	7.201 x 10 ⁻²	7.061 x 10 ⁻³	7.201 x 10 ⁻²	7.201 x 10 ⁻²	1	1	2.590 x 10 ⁻³	6.25 x 10 ⁻²	1.6188 x 10 ⁻⁴	2.340 x 10 ⁻⁴	7.23301
lb in ²	2.9264	2.984 x 10 ⁻³	2.984 x 10 ⁻⁵	2.984 x 10 ⁻⁵	2.984 x 10 ⁻³	16	16	4.144 x 10 ⁻²	1	2.590 x 10 ⁻³	6.944 x 10 ⁻³	5.208 x 10 ³
lb in ²	1129.85	1.15212	1.152 x 10 ⁻²	1.152 x 10 ⁻²	1.152 x 10 ⁻²	6177.42	6177.42	16	396.089	1	2.68117	2.1584 x 10 ⁻⁴
lb ft ²	421.401	4.297 x 10 ⁻¹	4.297 x 10 ⁻³	4.297 x 10 ⁻³	4.297 x 10 ⁻¹	2304	2304	59875.4	144	3.729 x 10 ⁻¹	1	8.333 x 10 ⁻²
lb ft ²	13558.2	13.8255	1.382 x 10 ⁻¹	1.382 x 10 ⁻¹	1.382 x 10 ⁻¹	74129	74129	192	4633.06	12	32.174	3.108 x 10 ⁻²

Table G.5: Torque Conversions

	N cm	Nm	kp cm	kp m	p cm	oz in	oz in	oz in	in lb	in lb	ft lb
N cm	1										
Nm	100	10 ⁻²	1.019 x 10 ⁻¹	1.019 x 10 ⁻³	101.972	1.41612	1.41612	1.41612	8.850 x 10 ⁻²	7.375 x 10 ⁻³	7.375 x 10 ⁻³
kp cm	9.80665	9.806 x 10 ⁻²	10.1972	1.019 x 10 ⁻¹	10197.2	141.612	141.612	13.8874	8.85075	7.375 x 10 ⁻¹	7.375 x 10 ⁻¹
kp m	980.665	9.80665	100	1	10 ⁵	1388.74	1388.74	1388.74	86.7962	7.23301	7.23301
p cm	9.806 x 10 ⁻³	9.806 x 10 ⁻⁵	10 ⁻³	10 ⁻⁵	1	1.388 x 10 ⁻²	1.388 x 10 ⁻²	1.388 x 10 ⁻²	8.679 x 10 ⁻⁴	7.233 x 10 ⁻⁶	7.233 x 10 ⁻⁶
oz in	7.061 x 10 ⁻¹	7.061 x 10 ⁻³	7.200 x 10 ⁻²	7.200 x 10 ⁻⁴	72.0078	1	1	1	6.25 x 10 ⁻²	5.208 x 10 ⁻³	5.208 x 10 ⁻³
in lb	11.2985	1.129 x 10 ⁻¹	1.15212	1.152 x 10 ⁻²	1152.12	16	16	16	1	8.333 x 10 ⁻²	8.333 x 10 ⁻²
ft lb	135.582	1.35582	13.8225	1.382 x 10 ⁻¹	13825.5	192	192	192	12	1	1

Table G.6: Force Conversions

	N	kp	p	oz	lbf
N	1				
kp	9.80665	1.019 x 10 ⁻¹	101.972	3.59694	2.248 x 10 ⁻¹
p	9.806 x 10 ⁻³	1	1000	35.274	2.20462
oz	2.780 x 10 ⁻¹	10 ⁻³	1	3.5274 x 10 ⁻²	2.206 x 10 ⁻³
lbf	4.44822	2.835 x 10 ⁻²	28.3495	1	6.25 x 10 ⁻²

Table G.7: Power Conversions

	kW	PS	hp	kp m s ⁻¹	kcal s ⁻¹
kW	1				
PS	7.355 x 10 ⁻¹	1.35962	1.34102	101.972	2.388 x 10 ⁻¹
hp	7.457 x 10 ⁻¹	1	9.8632 x 10 ⁻¹	75	1.756 x 10 ⁻¹
kp m s ⁻¹	9.806 x 10 ⁻³	1.01387	76.0402	1	1.781 x 10 ⁻¹
kcal s ⁻¹	4.1868	5.69246	5.69246	426.935	2.342 x 10 ⁻³

Table G.9: Torque Conversion Table
To Convert from A to B multiply by entry in Table

A	B	dyne-cm	gm-cm	oz-in	kg-cm	lb-in	newton-m	lb-ft	kg-m
dyne-cm	1.000								
gm-cm	980.7	1.020 x 10 ⁻³	1.000	1.416 x 10 ⁻⁵	1.020 x 10 ⁻⁵	8.851 x 10 ⁻⁷	10 ⁻⁷	7.376 x 10 ⁻⁵	1.020 x 10 ⁻⁵
oz-in	7.062 x 10 ⁴	72.01	1.000	7.201 x 10 ⁻²	6.250 x 10 ⁻²	7.062 x 10 ⁻³	5.206 x 10 ⁻³	7.201 x 10 ⁻⁴	
kg-cm	9.807 x 10 ⁵	1000	13.89	1.000	0.8680	9.807 x 10 ⁻²	7.233 x 10 ⁻²	10 ⁻²	
ob-in	1.130 x 10 ⁸	1.152 x 10 ³	16.00	1.152	1.000	0.1130	8.333 x 10 ⁻²	1.152 x 10 ⁻²	
newton-m	10 ⁷	1.020 x 10 ⁴	141.6	10.20	8.851	1.000	0.7376	0.1020	
lb-ft	1.356 x 10 ⁷	1.383 x 10 ⁴	192.0	13.83	12.00	1.356	1.000	0.1383	
kg-m	9.807 x 10 ⁷	10 ⁵	1.389 x 10 ³	100.0	86.80	9.807	7.233	1.000	

Table G.8: Rotary Inertia Conversion Table
To Convert from A to B: multiply by entry in Table

A	B	gm-cm ²	oz-in ²	gm-cm-sec ²	kg-cm ²	lb-in ²	oz-in-sec ²	lb-ft ²	kg-cm-sec ²	lb-in-sec ²	lb-ft-sec ² or slug-ft ²
gm-cm ²	1.000										
oz-in ²	162.9	1.000	0.1865	0.1829	6.250 x 10 ⁻²	2.590 x 10 ⁻³	4.340 x 10 ⁻⁴	1.865 x 10 ⁻⁴	1.619 x 10 ⁻⁴	1.349 x 10 ⁻⁵	
gm-cm-sec ²	980.7	5.362	1.000	0.9807	0.3351	1.389 x 10 ⁻²	2.327 x 10 ⁻³	10 ⁻³	8.680 x 10 ⁻⁵	7.233 x 10 ⁻⁵	
kg-cm ²	1000	5.4875	1.020	1.000	0.3417	1.416 x 10 ⁻²	2.373 x 10 ⁻³	1.020 x 10 ⁻³	8.851 x 10 ⁻⁴	7.376 x 10 ⁻⁵	
lb-in ²	2.926 x 10 ³	16.00	2.984	2.926	1.000	4.144 x 10 ⁻²	6.944 x 10 ⁻³	2.984 x 10 ⁻³	2.590 x 10 ⁻³	2.158 x 10 ⁻⁴	
oz-in-sec ²	7.062 x 10 ⁴	386.1	72.01	70.62	24.13	1.000	0.1676	7.201 x 10 ⁻²	6.250 x 10 ⁻²	5.208 x 10 ⁻³	
lb-ft ²	4.214 x 10 ⁵	2304	429.7	421.4	144.0	5.968	1.000	0.4297	0.3730	3.108 x 10 ⁻²	
kg-cm-sec ²	9.807 x 10 ⁵	5.362 x 10 ³	1000	980.7	335.1	13.89	2.327	1.000	0.8680	7.233 x 10 ⁻²	
lb-in-sec ²	1.130 x 10 ⁸	3.177 x 10 ³	1.152 x 10 ³	1.130 x 10 ³	386.1	16.00	2.681	1.152	1.000	8.333 x 10 ⁻²	
lb-ft-sec ² or slug-ft ²	1.356 x 10 ⁷	7.413 x 10 ⁴	1.383 x 10 ⁴	1.356 x 10 ⁴	4.633 x 10 ³	192.0	32.17	13.83	12.00	1.000	