



**GACC South, Skills Initiative
Blue Book Training Exercises
For GA CATT Exams**



German American
Chambers of Commerce
Deutsch-Amerikanische
Handelskammern



ICATT | APPRENTICESHIP
PROGRAM

4

Conversion

Inches / Fractions / to Decimals and Metric



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Abbreviations and Units of Measurements:

Bluebook Pg. 10

Millimeter = mm

Centimeter = cm

Decimeter = dm

Meter = m



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10 1.1 Units of measurement

Units of measurement

SI¹⁾ base quantities and base units cf. DIN 1301-1 (2010-10), -2 (1978-02), -3 (1979-10)

Base quantity	Length	Mass	Time	Electric current	Thermo-dynamic temperature	Amount of substance	Luminous intensity
Base units	metre	kilogramme	second	ampere	kelvin	mole	candela
Unit symbol	m	kg	s	A	K	mol	cd

¹⁾ The units for measurement are defined in the International System of Units SI (Système International d'Unités). It is based on the seven basic units (SI units), from which other units are derived.

Base quantities, derived quantities and their units

Quantity	Symbol	Unit Name	Symbol	Relationship	Remarks Examples of application
Length, Area, Volume, Angle					
Length	<i>l</i>	metre	m	1 m = 10 dm = 100 cm = 1000 mm 1 mm = 1000 µm 1 km = 1000 m	1 inch = 25.4 mm In aviation and nautical applications the following applies: 1 international nautical mile = 1852 m
Area	A, S	square metre are hectare	m ² a ha	1 m ² = 10 000 cm ² = 1 000 000 mm ² 1 a = 100 m ² 1 ha = 100 a = 10 000 m ² 100 ha = 1 km ²	Symbol S only for cross-sectional areas Ar and hectare only for land
Volume	V	cubic metre litre	m ³ l, L	1 m ³ = 1000 dm ³ = 1 000 000 cm ³ 1 l = 1 L = 1 dm ³ = 10 dl = 0.001 m ³ 1 ml = 1 cm ³	Mostly for fluids and gases
Plane angle (angle)	$\alpha, \beta, \gamma \dots$	radian degrees minutes seconds	rad ° ' "	1 rad = 1 m/m = 57.2957...° = 180°/π 1° = $\frac{\pi}{180}$ rad = 60' 1' = 1°/60 = 60" 1" = 1°/60 = 1°/3600	1 rad is the angle formed by the intersection of a circle around the centre of 1 m radius with an arc of 1 m length. In technical calculations instead of $\alpha = 33^\circ 17' 27.6''$ it is better to use $\alpha = 33.291^\circ$.
Solid angle	Ω	steradian	sr	1 sr = 1 m ² /m ²	The solid angle of 1 sr encompasses a sphere of r = 1 m on the surface, which corresponds to the area of a spherical segment of A ₀ = 1 m ² .
Mechanics					
Mass	<i>m</i>	kilogramme gram megagram metric ton	kg g Mg t	1 kg = 1000 g 1 g = 1000 mg 1 t = 1000 kg = 1 Mg 0.2 g = 1 ct	In everyday language, the mass of a solid is also referred to as weight. Mass for precious stones in carat (ct).
Linear mass density	<i>m'</i>	kilogramme per metre	kg/m	1 kg/m = 1 g/mm	For calculating the mass of bars, pro-files, pipes.
Area mass density	<i>m''</i>	kilogramme per square metre	kg/m ²	1 kg/m ² = 0.1 g/cm ²	To calculate the mass of sheet metal.
Density	<i>ρ</i>	kilogramme per cubic metre	kg/m ³	1000 kg/m ³ = 1 metric t/m ³ = 1 kg/dm ³ = 1 g/cm ³ = 1 g/ml = 1 mg/mm ³	Density = Mass of a substance per volume unit For homogenous solids, the density is a location-independent quantity.

Questions:

How many mm is 1 inch?

25.4mm

How many inches is 1' foot?

12"

How many mm is 1' foot?

12 x 25.4mm = 304.8mm

How many feet are in 1 yard?

3' feet or 36"

How many mm are in 1 yard?

914.4mm



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Questions:

How many mm is 1 cm?

10mm

How many cm is 1 dm?

10cm

How many cm is 1 m?

100cm

How many dm is 1 m?

10dm

How many mm is 1 m?

1000mm



Questions:

How many mm is 4.687”?

$$4.687'' \times 25.4\text{mm} = 119.05\text{mm}$$

How many mm is 2 3/8”?

$$2 \frac{3}{8}'' = 2.375'' \times 25.4 = 60.325\text{mm}$$

How many cm is 60.325mm?

$$60.325\text{mm} / 10 = 6.0325\text{cm}$$

Convert 7 5/16” to decimal?

$$1 / 16 \times 5 = .3125 + 7 = 7.3125''$$



The next slide contains 2 charts with Metric Equivalents:

1. Millimeters to Decimals

2. Decimals to millimeters and Fractions to Millimeters.



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METRIC EQUIVALENTS

MILLIMETERS TO DECIMALS

MM	DECIMAL	MM	DECIMAL	MM	DECIMAL	MM	DECIMAL	MM	DECIMAL
0.01	.0004	0.41	.0161	0.81	.0319	21	.8268	61	2.4016
0.02	.0008	0.42	.0165	0.82	.0323	22	.8661	62	2.4409
0.03	.0012	0.43	.0169	0.83	.0327	23	.9055	63	2.4803
0.04	.0016	0.44	.0173	0.84	.0331	24	.9449	64	2.5197
0.05	.0020	0.45	.0177	0.85	.0335	25	.9843	65	2.5591
0.06	.0024	0.46	.0181	0.86	.0339	26	1.0236	66	2.5984
0.07	.0028	0.47	.0185	0.87	.0343	27	1.0630	67	2.6378
0.08	.0032	0.48	.0189	0.88	.0347	28	1.1024	68	2.6772
0.09	.0035	0.49	.0193	0.89	.0350	29	1.1417	69	2.7165
0.10	.0039	0.50	.0197	0.90	.0354	30	1.1811	70	2.7559
0.11	.0043	0.51	.0201	0.91	.0358	31	1.2205	71	2.7953
0.12	.0047	0.52	.0205	0.92	.0362	32	1.2598	72	2.8346
0.13	.0051	0.53	.0209	0.93	.0366	33	1.2992	73	2.8740
0.14	.0055	0.54	.0213	0.94	.0370	34	1.3386	74	2.9134
0.15	.0059	0.55	.0217	0.95	.0374	35	1.3780	75	2.9528
0.16	.0063	0.56	.0221	0.96	.0378	36	1.4173	76	2.9921
0.17	.0067	0.57	.0224	0.97	.0382	37	1.4567	77	3.0315
0.18	.0071	0.58	.0228	0.98	.0386	38	1.4961	78	3.0709
0.19	.0075	0.59	.0232	0.99	.0390	39	1.5354	79	3.1102
0.20	.0079	0.60	.0236	1.00	.0394	40	1.5748	80	3.1496
0.21	.0083	0.61	.0240	1	.0394	41	1.6142	81	3.1890
0.22	.0087	0.62	.0244	2	.0787	42	1.6535	82	3.2283
0.23	.0091	0.63	.0248	3	.1181	43	1.6929	83	3.2677
0.24	.0095	0.64	.0252	4	.1575	44	1.7323	84	3.3071
0.25	.0098	0.65	.0256	5	.1969	45	1.7717	85	3.3465
0.26	.0102	0.66	.0260	6	.2362	46	1.8110	86	3.3858
0.27	.0106	0.67	.0264	7	.2756	47	1.8504	87	3.4252
0.28	.0110	0.68	.0268	8	.3150	48	1.8898	88	3.4646
0.29	.0114	0.69	.0272	9	.3543	49	1.9291	89	3.5039
0.30	.0118	0.70	.0276	10	.3937	50	1.9685	90	3.5433
0.31	.0122	0.71	.0280	11	.4331	51	2.0079	91	3.5827
0.32	.0126	0.72	.0284	12	.4724	52	2.0472	92	3.6220
0.33	.0130	0.73	.0287	13	.5118	53	2.0866	93	3.6614
0.34	.0134	0.74	.0291	14	.5512	54	2.1260	94	3.7008
0.35	.0138	0.75	.0295	15	.5906	55	2.1654	95	3.7402
0.36	.0142	0.76	.0299	16	.6299	56	2.2047	96	3.7795
0.37	.0146	0.77	.0303	17	.6693	57	2.2441	97	3.8189
0.38	.0150	0.78	.0307	18	.7087	58	2.2835	98	3.8583
0.39	.0154	0.79	.0311	19	.7480	59	2.3228	99	3.8976
0.40	.0158	0.80	.0315	20	.7874	60	2.3622	100	3.9370

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METRIC EQUIVALENTS

DECIMALS TO MILLIMETERS

FRACTIONS TO DECIMALS TO MILLIMETERS

DECIMAL	MM	DECIMAL	MM	FRACTION	DECIMAL	MM	FRACTION	DECIMAL	MM
.001	0.03	.470	11.94	1/64	.0156	0.40	33/64	.5156	13.10
.002	0.05	.480	12.19	1/32	.0313	0.79	17/32	.5313	13.49
.003	0.08	.490	12.45	3/64	.0469	1.19	35/64	.5469	13.89
.004	0.10	.500	12.70						
.005	0.13	.510	12.95	1/16	.0625	1.59	9/16	.5625	14.29
.006	0.15	.520	13.21						
.007	0.18	.530	13.46						
.008	0.20	.540	13.72	5/64	.0781	1.98	37/64	.5781	14.68
.009	0.23	.550	13.97	3/32	.0938	2.38	19/32	.5938	15.08
.010	0.25	.560	14.22	7/64	.1094	2.78	39/64	.6094	15.48
.020	0.51	.570	14.48						
.030	0.76	.580	14.73						
.040	1.02	.590	14.99	1/8	.1250	3.18	5/8	.6250	15.88
.050	1.27	.600	15.24						
.060	1.52	.610	15.49	9/64	.1406	3.57	41/64	.6406	16.27
.070	1.78	.620	15.75	5/32	.1563	3.97	21/32	.6563	16.67
.080	2.03	.630	16.00	11/64	.1719	4.37	43/64	.6719	17.07
.090	2.29	.640	16.26						
.100	2.54	.650	16.51						
.110	2.79	.660	16.76	3/16	.1875	4.76	11/16	.6875	17.46
.120	3.05	.670	17.02						
.130	3.30	.680	17.27	13/64	.2031	5.16	45/64	.7031	17.86
.140	3.56	.690	17.53	7/32	.2188	5.56	23/32	.7188	18.26
.150	3.81	.700	17.78	15/64	.2344	5.95	47/64	.7344	18.65
.160	4.06	.710	18.03						
.170	4.32	.720	18.29	1/4	.2500	6.35	3/4	.7500	19.05
.180	4.57	.730	18.54						
.190	4.83	.740	18.80	17/64	.2656	6.75	49/64	.7656	19.45
.200	5.08	.750	19.05	9/32	.2813	7.14	25/32	.7813	19.84
.210	5.33	.760	19.30	19/64	.2969	7.54	51/64	.7969	20.24
.220	5.59	.770	19.56						
.230	5.84	.780	19.81						
.240	6.10	.790	20.07	5/16	.3125	7.94	13/16	.8125	20.64
.250	6.35	.800	20.32						
.260	6.60	.810	20.57	21/64	.3281	8.33	53/64	.8281	21.03
.270	6.86	.820	20.83	11/32	.3438	8.78	27/32	.8438	21.43
.280	7.11	.830	21.08	23/64	.3594	9.13	55/64	.8594	21.83
.290	7.37	.840	21.34						
.300	7.62	.850	21.59						
.310	7.87	.860	21.84	3/8	.3750	9.53	7/8	.8750	22.23
.320	8.13	.870	22.10						
.330	8.38	.880	22.35	25/64	.3906	9.92	57/64	.8906	22.62
.340	8.64	.890	22.61	13/32	.4062	10.32	29/32	.9063	23.02
.350	8.89	.900	22.86	27/64	.4219	10.72	59/64	.9219	23.42
.360	9.14	.910	23.11						
.370	9.40	.920	23.37	7/16	.4375	11.11	15/16	.9375	23.81
.380	9.65	.930	23.62						
.390	9.91	.940	23.88						
.400	10.16	.950	24.13	29/64	.4531	11.51	61/64	.9531	24.21
.410	10.41	.960	24.38	15/32	.4688	11.91	31/32	.9688	24.61
.420	10.67	.970	24.64	31/64	.4844	12.30	63/64	.9844	25.00
.430	10.92	.980	24.89						
.440	11.18	.990	25.15						
.450	11.43	1.00	25.40	1/2	.5000	12.70	1	1.0000	25.40
.460	11.68								

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