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*The*  
**STATE**  
**SAVINGS BANK**  
**REFERENCE**  
**BOOK**  
*of*

**TABLES**  
**AND**  
**USEFUL**  
**INFORMATION**

ISSUED BY  
**THE STATE SAVINGS BANK OF VICTORIA**



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## SIGNS USED IN MATHEMATICS—continued.

- × The sign of Multiplication.  $6 \times 5 = 30$ , signifies that 6 multiplied by 5 equals 30.
- ÷ The sign of Division.  $30 \div 5 = 6$ , signifies that 30 divided by 5 equals 6.  $\frac{30}{5}$  also signifies that 30 is divided by 5.
- ∴ Signifies therefore. ∵ Signifies because.
- :
- ∴ Signifies is to; ∵ signifies so is; and ∴ signifies to. (These are signs to express Proportion.)
- The expression—As 6:9::8:12—is read thus:—  
As 6 is to 9 so is 8 to 12.
- L, l, & Signifies pounds, *L* being the first letter of the Latin word *Libra*, meaning a pound.
- S, s Signifies shillings, *S* being the first letter of the Latin word *Solidus*, meaning a shilling.
- D, d Signifies pence, *D* being the first letter of the Latin word *Denarius*, meaning a penny.
- $\frac{1}{4}$  Denotes a farthing; a quarter of anything; or 1 divided by 4.
- $\frac{1}{2}$  Denotes a halfpenny; a half of anything; or 1 divided by 2.
- $\frac{3}{4}$  Denotes three farthings; three-quarters of anything; or 3 divided by 4.
- √ is called the Radix, the Latin name for Root.
- √ Signifies the Square Root.  $\sqrt{100}$  denotes the square root of 100 = 10.
- $\sqrt[3]{}$  Signifies the Cube Root.  $\sqrt[3]{125}$  denotes the cube root of 125 = 5.
- $\sqrt[4]{}$  Signifies the Fourth Root.  $\sqrt[4]{16}$  denotes the fourth root of 16 = 2.
- $a^2$  Called a squared =  $a \times a$ .
- $a^3$  Called a cubed =  $a \times a \times a$ .
- $a^4$  Called a to the fourth power =  $a \times a \times a \times a$ .

## SIGNS USED IN MATHEMATICS—continued.

- | Indicates perpendicular to.
- || Indicates parallel to.
- ∕ Indicates oblique to.
- ∠ Indicates an acute angle.
- └ Indicates a right angle.
- ∩ Indicates an obtuse angle.
- △ Indicates a triangle.
- Indicates a square.
- ◻ Indicates a rectangle.
- Indicates a circle.
- ° Indicates degree, as  $50^\circ$  stands for 50 degrees.
- ' Indicates minutes, as  $50^\circ 10'$  means 50 degrees 10 minutes
- " Indicates seconds, as  $50^\circ 10' 20''$  means 50 degrees 10 minutes 20 seconds.
- ' Also indicates feet, and " inches. Thus,  $5' 6''$  means 5 feet 6 inches.

## ARITHMETICAL TERMS

- Sum = The answer of an Addition sum.
- Difference = The answer of a Subtraction sum.
- Product = The answer of a Multiplication sum.
- Quotient = The answer of a Division sum.
- Multiplicand = The number to be multiplied.
- Dividend = The number to be divided.
- Multiplier = The number that multiplies.
- Divisor = The number that divides.
- Measure = The number which will exactly divide another number.
- G. C. M. = Greatest Common Measure, is the greatest number which will exactly divide any two or more numbers.
- Factors = Are numbers which, when multiplied together, make up another number.
- Multiple = The number which contains another an exact number of times.
- L. C. M. = The least number which contains two or more numbers an exact number of times.



**NUMERATION TABLE**

1	.....	Units.
10	.....	Tens of Units.
100	.....	Hundreds of Units.
1,000	.....	Thousands.
10,000	.....	Tens of Thousands.
100,000	.....	Hundreds of Thousands.
1,000,000	.....	Millions.

And further,

10,000,000	.....	Tens of Millions.
100,000,000	.....	Hundreds of Millions.
1,000,000,000	.....	Thousands of Millions.
10,000,000,000	.....	Ten Thousands of Millions.
100,000,000,000	.....	Hundred Thousands of Millions.
1,000,000,000,000	.....	Billion.

**DECIMAL NUMERATION**

.1	.....	(Read, decimal 1) Tenths, or $\frac{1}{10}$
.01	.....	Hundredths, or $\frac{1}{100}$
.001	.....	Thousandths, or $\frac{1}{1,000}$
.0,001	.....	Ten Thousandths or, $\frac{1}{10,000}$
.00,001	.....	Hundred Thousandths, or $\frac{1}{100,000}$
.000,001	.....	Millionths, or $\frac{1}{1,000,000}$

**ADDITION TABLE**

1		2		3		4		5		6	
and		and		and		and		and		and	
1 are	2	1 are	3	1 are	4	1 are	5	1 are	6	1 are	7
2 "	3	2 "	4	2 "	5	2 "	6	2 "	7	2 "	8
3 "	4	3 "	5	3 "	6	3 "	7	3 "	8	3 "	9
4 "	5	4 "	6	4 "	7	4 "	8	4 "	9	4 "	10
5 "	6	5 "	7	5 "	8	5 "	9	5 "	10	5 "	11
6 "	7	6 "	8	6 "	9	6 "	10	6 "	11	6 "	12
7 "	8	7 "	9	7 "	10	7 "	11	7 "	12	7 "	13
8 "	9	8 "	10	8 "	11	8 "	12	8 "	13	8 "	14
9 "	10	9 "	11	9 "	12	9 "	13	9 "	14	9 "	15
10 "	11	10 "	12	10 "	13	10 "	14	10 "	15	10 "	16
11 "	12	11 "	13	11 "	14	11 "	15	11 "	16	11 "	17
12 "	13	12 "	14	12 "	15	12 "	16	12 "	17	12 "	18
7		8		9		10		11		12	
and		and		and		and		and		and	
1 are	8	1 are	9	1 are	10	1 are	11	1 are	12	1 are	13
2 "	9	2 "	10	2 "	11	2 "	12	2 "	13	2 "	14
3 "	10	3 "	11	3 "	12	3 "	13	3 "	14	3 "	15
4 "	11	4 "	12	4 "	13	4 "	14	4 "	15	4 "	16
5 "	12	5 "	13	5 "	14	5 "	15	5 "	16	5 "	17
6 "	13	6 "	14	6 "	15	6 "	16	6 "	17	6 "	18
7 "	14	7 "	15	7 "	16	7 "	17	7 "	18	7 "	19
8 "	15	8 "	16	8 "	17	8 "	18	8 "	19	8 "	20
9 "	16	9 "	17	9 "	18	9 "	19	9 "	20	9 "	21
10 "	17	10 "	18	10 "	19	10 "	20	10 "	21	10 "	22
11 "	18	11 "	19	11 "	20	11 "	21	11 "	22	11 "	23
12 "	19	12 "	20	12 "	21	12 "	22	12 "	23	12 "	24



## SUBTRACTION TABLE

1	2	3	4	5	6
from	from	from	from	from	from
1	0	2	0	3	0
2	1	3	1	4	1
3	2	4	2	5	2
4	3	5	3	6	3
5	4	6	4	7	4
6	5	7	5	8	5
7	6	8	6	9	6
8	7	9	7	10	7
9	8	10	8	11	8
10	9	11	9	12	9
11	10	12	10	13	10
12	11	13	11	14	11
		14	11	15	11
		15	11	16	11
		16	11	17	11

7	8	9	10	11	12
from	from	from	from	from	from
7	0	8	0	9	0
8	1	9	1	10	1
9	2	10	2	11	2
10	3	11	3	12	3
11	4	12	4	13	4
12	5	13	5	14	5
13	6	14	6	15	6
14	7	15	7	16	7
15	8	16	8	17	8
16	9	17	9	18	9
17	10	18	10	19	10
18	11	19	11	20	11
		20	11	21	11
		21	11	22	11
		22	11	23	11

## MULTIPLICATION TABLE

TWICE	3	4	5	6
	times	times	times	times
1 are 2	1 are 3	1 are 4	1 are 5	1 are 6
2 " 4	2 " 6	2 " 8	2 " 10	2 " 12
3 " 6	3 " 9	3 " 12	3 " 15	3 " 18
4 " 8	4 " 12	4 " 16	4 " 20	4 " 24
5 " 10	5 " 15	5 " 20	5 " 25	5 " 30
6 " 12	6 " 18	6 " 24	6 " 30	6 " 36
7 " 14	7 " 21	7 " 28	7 " 35	7 " 42
8 " 16	8 " 24	8 " 32	8 " 40	8 " 48
9 " 18	9 " 27	9 " 36	9 " 45	9 " 54
10 " 20	10 " 30	10 " 40	10 " 50	10 " 60
11 " 22	11 " 33	11 " 44	11 " 55	11 " 66
12 " 24	12 " 36	12 " 48	12 " 60	12 " 72

7	8	9	10	11	12
times	times	times	times	times	times
1 are 7	1 are 8	1 are 9	1 are 10	1 are 11	1 are 12
2 " 14	2 " 16	2 " 18	2 " 20	2 " 22	2 " 24
3 " 21	3 " 24	3 " 27	3 " 30	3 " 33	3 " 36
4 " 28	4 " 32	4 " 36	4 " 40	4 " 44	4 " 48
5 " 35	5 " 40	5 " 45	5 " 50	5 " 55	5 " 60
6 " 42	6 " 48	6 " 54	6 " 60	6 " 66	6 " 72
7 " 49	7 " 56	7 " 63	7 " 70	7 " 77	7 " 84
8 " 56	8 " 64	8 " 72	8 " 80	8 " 88	8 " 96
9 " 63	9 " 72	9 " 81	9 " 90	9 " 99	9 " 108
10 " 70	10 " 80	10 " 90	10 " 100	10 " 110	10 " 120
11 " 77	11 " 88	11 " 99	11 " 110	11 " 121	11 " 132
12 " 84	12 " 96	12 " 108	12 " 120	12 " 132	12 " 144



**THE MULTIPLICATION TABLE  
AT A GLANCE**

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

**EXTENDED MULTIPLICATION TABLE**

13 times	14times	15times	16times	17times	18times	19times
1 are 13	1 are 14	1 are 15	1 are 16	1 are 17	1 are 18	1 are 19
2 ,, 26	2 ,, 28	2 ,, 30	2 ,, 32	2 ,, 34	2 ,, 36	2 ,, 38
3 ,, 39	3 ,, 42	3 ,, 45	3 ,, 48	3 ,, 51	3 ,, 54	3 ,, 57
4 ,, 52	4 ,, 56	4 ,, 60	4 ,, 64	4 ,, 68	4 ,, 72	4 ,, 76
5 ,, 65	5 ,, 70	5 ,, 75	5 ,, 80	5 ,, 85	5 ,, 90	5 ,, 95
6 ,, 78	6 ,, 84	6 ,, 90	6 ,, 96	6 ,, 102	6 ,, 108	6 ,, 114
7 ,, 91	7 ,, 98	7 ,, 105	7 ,, 112	7 ,, 119	7 ,, 126	7 ,, 133
8 ,, 104	8 ,, 112	8 ,, 120	8 ,, 128	8 ,, 136	8 ,, 144	8 ,, 152
9 ,, 117	9 ,, 126	9 ,, 135	9 ,, 144	9 ,, 153	9 ,, 162	9 ,, 171
10 ,, 130	10 ,, 140	10 ,, 150	10 ,, 160	10 ,, 170	10 ,, 180	10 ,, 190
11 ,, 143	11 ,, 154	11 ,, 165	11 ,, 176	11 ,, 187	11 ,, 198	11 ,, 209
12 ,, 156	12 ,, 168	12 ,, 180	12 ,, 192	12 ,, 204	12 ,, 216	12 ,, 228
13 ,, 169	13 ,, 182	13 ,, 195	13 ,, 208	13 ,, 221	13 ,, 234	13 ,, 247
14 ,, 182	14 ,, 196	14 ,, 210	14 ,, 224	14 ,, 238	14 ,, 252	14 ,, 266
15 ,, 195	15 ,, 210	15 ,, 225	15 ,, 240	15 ,, 255	15 ,, 270	15 ,, 285
16 ,, 208	16 ,, 224	16 ,, 240	16 ,, 256	16 ,, 272	16 ,, 288	16 ,, 304
17 ,, 221	17 ,, 238	17 ,, 255	17 ,, 272	17 ,, 289	17 ,, 306	17 ,, 323
18 ,, 234	18 ,, 252	18 ,, 270	18 ,, 288	18 ,, 306	18 ,, 324	18 ,, 342
19 ,, 247	19 ,, 266	19 ,, 285	19 ,, 304	19 ,, 323	19 ,, 342	19 ,, 361
20 ,, 260	20 ,, 280	20 ,, 300	20 ,, 320	20 ,, 340	20 ,, 360	20 ,, 380

**DIVISION TABLE**

2	3	4	5	6	7
into	into	into	into	into	into
2 = 1	3 = 1	4 = 1	5 = 1	6 = 1	7 = 1
4 = 2	6 = 2	8 = 2	10 = 2	12 = 2	14 = 2
6 = 3	9 = 3	12 = 3	15 = 3	18 = 3	21 = 3
8 = 4	12 = 4	16 = 4	20 = 4	24 = 4	28 = 4
10 = 5	15 = 5	20 = 5	25 = 5	30 = 5	35 = 5
12 = 6	18 = 6	24 = 6	30 = 6	36 = 6	42 = 6
14 = 7	21 = 7	28 = 7	35 = 7	42 = 7	49 = 7
16 = 8	24 = 8	32 = 8	40 = 8	48 = 8	56 = 8
18 = 9	27 = 9	36 = 9	45 = 9	54 = 9	63 = 9
20 = 10	30 = 10	40 = 10	50 = 10	60 = 10	70 = 10
22 = 11	33 = 11	44 = 11	55 = 11	66 = 11	77 = 11
24 = 12	36 = 12	48 = 12	60 = 12	72 = 12	84 = 12

8	9	10	11	12
into	into	into	into	into
8 = 1	9 = 1	10 = 1	11 = 1	12 = 1
16 = 2	18 = 2	20 = 2	22 = 2	24 = 2
24 = 3	27 = 3	30 = 3	33 = 3	36 = 3
32 = 4	36 = 4	40 = 4	44 = 4	48 = 4
40 = 5	45 = 5	50 = 5	55 = 5	60 = 5
48 = 6	54 = 6	60 = 6	66 = 6	72 = 6
56 = 7	63 = 7	70 = 7	77 = 7	84 = 7
64 = 8	72 = 8	80 = 8	88 = 8	96 = 8
72 = 9	81 = 9	90 = 9	99 = 9	108 = 9
80 = 10	90 = 10	100 = 10	110 = 10	120 = 10
88 = 11	99 = 11	110 = 11	121 = 11	132 = 11
96 = 12	108 = 12	120 = 12	132 = 12	144 = 12



**MONEY TABLE**

4 farthings ..... = 1 penny .....d.  
 12 pence ..... = 1 shilling .....s.  
 20 shillings ..... = 1 pound.....£  
 ¼d. = 1 farthing. ½d. = 2 farthings. ¾d. = 3 farthings.  
 4 farthings = 1 penny.  
 48 farthings = 12 pence = 1 shilling.  
 960 farthings = 240 pence = 20 shillings = 1 pound.

**\*COINS IN USE**

**Gold—**  
 Sovereign or pound = £1 or 20s.  
 Half-sovereign.... = 10s.  
 Florin. .... = 2s.  
 Shilling .... = 1s.  
 Sixpence .. = 6d.  
 Threepence = 3d.

**Silver—**  
 Crown ..... = 5s.  
 Double Florin ... = 4s.  
 Half-crown ..... = 2s. 6d.  
**Bronze—**  
 Penny ..... = 1d.  
 Halfpenny . = ½d.  
 Farthing .. = ¼d.

12 ozs. Troy of standard gold (22 parts pure gold to 2 parts alloy) is coined into 46<sup>2</sup>/<sub>10</sub> sovereigns.

12 ozs. Troy of standard silver (1 part pure silver to 1 part alloy) is coined into 66 shillings.

One pound Avoirdupois of bronze is coined into 48 pennies.

Silver is legal tender up to 40s.; bronze up to 12d.; but farthings only up to 6d.

\*Since 1914 gold coins have not been in general circulation, being superseded by "Bank Notes" of £1 and 10s. The Crown and Double Florin are no longer minted. The Farthing is not minted in Australia.

**OTHER COINS FORMERLY USED.**

**Gold** { Guinea ..... = 21s.  
 Half-guinea ..... = 10s. 6d.  
 Mark ..... = 13s. 4d.  
 Angel ..... = 10s. 0d.  
**Silver** { Noble ..... = 6s. 8d..  
 Tester ..... = 0s. 6d.  
 Groat..... = 0s. 4d.

**FARTHINGS TABLE**

	d.	s.	d.	s.	d.	s.	d.
2	=	1	½	33	=	8	1
4	=	1	1	34	=	8	2
5	=	1	1	35	=	8	3
6	=	1	2	36	=	9	0
7	=	1	2	37	=	9	1
8	=	2	0	38	=	9	2
9	=	2	1	39	=	9	3
10	=	2	2	40	=	10	0
11	=	2	3	41	=	10	1
12	=	3	0	42	=	10	2
13	=	3	1	43	=	10	3
14	=	3	2	44	=	11	0
15	=	3	3	45	=	11	1
16	=	4	0	46	=	11	2
17	=	4	1	47	=	11	3
18	=	4	2	48	=	1	0
19	=	4	3	49	=	1	0
20	=	5	0	50	=	1	0
21	=	5	1	51	=	1	0
22	=	5	2	52	=	1	1
23	=	5	3	53	=	1	1
24	=	6	0	54	=	1	1
25	=	6	1	55	=	1	2
26	=	6	2	56	=	1	2
27	=	6	3	57	=	2	0
28	=	7	0	58	=	2	1
29	=	7	1	59	=	2	2
30	=	7	2	60	=	3	0
31	=	7	3	61	=	3	1
32	=	8	0	62	=	3	2
63	=	1	3	63	=	1	3
64	=	1	4	64	=	1	4
65	=	1	4	65	=	1	4
66	=	1	4	66	=	1	4
67	=	1	4	67	=	1	4
68	=	1	5	68	=	1	5
69	=	1	5	69	=	1	5
70	=	1	5	70	=	1	5
71	=	1	5	71	=	1	5
72	=	1	6	72	=	1	6
73	=	1	6	73	=	1	6
74	=	1	6	74	=	1	6
75	=	1	6	75	=	1	6
76	=	1	7	76	=	1	7
77	=	1	7	77	=	1	7
78	=	1	7	78	=	1	7
79	=	1	7	79	=	1	7
80	=	1	8	80	=	1	8
81	=	1	8	81	=	1	8
82	=	1	8	82	=	1	8
83	=	1	8	83	=	1	8
84	=	1	9	84	=	1	9
85	=	1	9	85	=	1	9
86	=	1	9	86	=	1	9
87	=	1	9	87	=	1	9
88	=	1	10	88	=	1	10
89	=	1	10	89	=	1	10
90	=	1	10	90	=	1	10
91	=	1	10	91	=	1	10
92	=	1	11	92	=	1	11
93	=	1	11	93	=	1	11
94	=	1	11	94	=	1	11
95	=	1	11	95	=	1	11
96	=	2	0	96	=	2	0
97	=	2	0	97	=	2	0
98	=	2	0	98	=	2	0
99	=	2	0	99	=	2	0
100	=	2	1	100	=	2	1
101	=	2	1	101	=	2	1
102	=	2	1	102	=	2	1
103	=	2	1	103	=	2	1
104	=	2	2	104	=	2	2
105	=	2	2	105	=	2	2
106	=	2	2	106	=	2	2
107	=	2	2	107	=	2	2
108	=	2	3	108	=	2	3
109	=	2	3	109	=	2	3
110	=	2	3	110	=	2	3
111	=	2	3	111	=	2	3
112	=	2	4	112	=	2	4
113	=	2	4	113	=	2	4
114	=	2	4	114	=	2	4
115	=	2	4	115	=	2	4
116	=	2	5	116	=	2	5
117	=	2	5	117	=	2	5
118	=	2	5	118	=	2	5
119	=	2	5	119	=	2	5
120	=	2	6	120	=	2	6
480	=	10	0	480	=	10	0
960	=	20	0	960	=	20	0

Note.—To change farthings into pence, divide them by 4.







## FOREIGN MONEY AND ENGLISH VALUES

Subject to varying rates of exchange.

<b>ARGENTINE REPUBLIC.</b>		
100 Centavos = 1 Peso (gold) or dollar	=	s. d. 3 11½
5 Peso piece (gold)	=	19 10
<b>AUSTRIA.</b>		
100 Groschen = 1 Schilling	=	0 6.94
25 Schilling	=	14 5½
34.58 Schilling	=	20 0
<b>BELGIUM.</b>		
100 Centimes = 1 Franc	=	0 1.37
5 Francs = 1 Belga	=	0 6.86
35 Belgas	=	20 0
<b>BRAZIL.</b>		
1,000 Reis = 1 (gold) Milrei (standard)	=	2 2½
10 Milreis	=	22 1
<b>BULGARIA.</b>		
100 Stotinkis = 1 Lev	=	0 0.35
673.7 Leva	=	20 0
<b>CHILE.</b>		
100 Centavos = 1 Peso	=	0 6
<b>CHINA.</b>		
100 Cents = 1 Tael (Dollar)	=	2 8
<b>DENMARK.</b>		
100 Ore = 1 Krone	=	1 1¼
10 Kroners or Crown pieces	=	11 1½
<b>EGYPT.</b>		
1 Piastre	=	0 2½
97.5 Piastres or £ Egyptian	=	20 0
<b>FINLAND.</b>		
100 Penni = 1 Markka	=	0 1¼
193.23 Markka	=	20 0
<b>FRANCE.</b>		
100 Centimes = 1 Franc	=	0 1.93
5 Franc piece	=	0 9.66
124.21 Francs	=	20 0

## FOREIGN MONEY AND ENGLISH VALUES—continued

Subject to varying rates of exchange.

<b>GERMANY.</b>		
100 Pfennige = 1 Mark ("Reichsmark")	=	s. d. 0 11¾
10 Mark piece	=	9 9¼
20 Mark piece	=	19 7
20 Mark 43 Pfennige	=	20 0
<b>GREECE.</b>		
100 Lepta = 1 Drachma (par value)	=	0 0.64
5 Drachma piece	=	0 3¼
20 Drachma piece	=	1 0¼
Present rate 375 Dr. = 20s.		
<b>HOLLAND.</b>		
100 Cents = 1 Guilder or Florin	=	1 8
10 Guilders	=	16 8
12 Guilders	=	20 0
<b>HUNGARY.</b>		
100 Filler = 1 Pengo	=	0 8.62
<b>INDIA.</b>		
4 Pice = 1 Anna	=	0 1
16 Annas = 1 Rupee	=	1 6
13½ Rupees	=	20 0
100,000 R. = 1 Lakh...10,000,000 R. = a Crore.		
<b>ITALY.</b>		
100 Centesimi = 1 Lira	=	0 2.6
92½ Lire	=	20 0
<b>JAPAN.</b>		
10 Rin = 1 Sen	=	0 0¼
100 Sen = 1 Yen or Dollar	=	2 0½
<b>MEXICO.</b>		
100 Centavos = 1 Peso (silver Dollar)	=	2 0½
<b>NORWAY AND SWEDEN.</b>		
100 Ore = 1 Kroner	=	1 1½
18½ Kroners or Crowns	=	20 0



## FOREIGN MONEY AND ENGLISH VALUES—continued

Subject to varying rates of exchange.

<b>PERSIA.</b>			
20	Shahis = 1 Kran.....	=	s. d. 0 4 $\frac{3}{4}$
10	Krans = 1 Toman (silver) .....	=	4 0
50	Krans .....	=	20 0
<b>PERU.</b>			
100	Centavos = 1 Sol .....	=	2 0
10	Soles = Libra .....	=	20 0
<b>PORTUGAL.</b>			
100	Centavos = 1 Escudo.....	=	4 5 $\frac{1}{4}$
10	Escudos.....	=	44 4 $\frac{1}{2}$
4 $\frac{1}{2}$	Escudos.....	=	20 0
<b>RUMANIA.</b>			
10	Bani = 1 Leu .....	=	0 0.3
813	Lei .....	=	20 0
<b>RUSSIA.</b>			
100	Kopecks = 1 Rouble .....	=	2 1 $\frac{1}{2}$
9 $\frac{1}{2}$	Roubles .....	=	20 0
<b>SPAIN.</b>			
100	Centesimos = 1 Peseta .....	=	0 9 $\frac{1}{2}$
25 $\frac{1}{2}$	Pesetas .....	=	20 0
<b>SWITZERLAND.</b>			
100	Centimes = 1 Franc .....	=	0 9 $\frac{1}{2}$
10	Franc piece .....	=	7 11 $\frac{1}{4}$
<b>TURKEY.</b>			
40	Paras = Piastre .....	=	0 2
100	Piastres = 1 Pound (Turkish Lira) .....	=	18 0
<b>UNITED STATES.</b>			
10	Cents = 1 Dime .....	=	0 5
100	Cents = 1 Dollar .....	=	4 2
10	Dollars = 1 Eagle .....	=	41 1 $\frac{1}{2}$
4	Dollars 86 $\frac{1}{2}$ Cents .....	=	20 0
<b>YUGOSLAVIA.</b>			
100	Paras = 1 Dinar .....	=	0 9 $\frac{1}{2}$

## INTEREST TABLES

1. Table showing the interest on various amounts, at sundry percentages, for one year.

RULE.—Multiply the amount by the rate per cent., and the product by the number of years, and divide the new product by 100.

Per Cent.

Amount	2			2 $\frac{1}{2}$			3			3 $\frac{1}{2}$			4		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
25	0	10	0	0	12	6	0	15	0	0	17	6	1	0	0
50	1	0	0	1	5	0	1	10	0	1	15	0	2	0	0
75	1	10	0	1	17	6	2	5	0	2	12	6	3	0	0
100	2	0	0	2	10	0	3	0	0	3	10	0	4	0	0
200	4	0	0	5	0	0	6	0	0	7	0	0	8	0	0
250	5	0	0	6	5	0	7	10	0	8	15	0	10	0	0
500	10	0	0	12	10	0	15	0	0	17	10	0	20	0	0
600	12	0	0	15	0	0	18	0	0	21	0	0	24	0	0
700	14	0	0	17	10	0	21	0	0	24	10	0	28	0	0
800	16	0	0	20	0	0	24	0	0	28	0	0	32	0	0
900	18	0	0	22	10	0	27	0	0	31	10	0	36	0	0
1,000	20	0	0	25	0	0	30	0	0	35	0	0	40	0	0

Amount	4 $\frac{1}{2}$			5			7 $\frac{1}{2}$			10		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
25	1	2	6	1	5	0	1	17	6	2	10	0
50	2	5	0	2	10	0	3	15	0	5	0	0
75	3	7	6	3	15	0	5	12	6	7	10	0
100	4	10	0	5	0	0	7	10	0	10	0	0
200	9	0	0	10	0	0	15	0	0	20	0	0
250	11	5	0	12	10	0	18	15	0	25	0	0
500	22	10	0	25	0	0	37	10	0	50	0	0
600	27	0	0	30	0	0	45	0	0	60	0	0
700	31	10	0	35	0	0	52	10	0	70	0	0
800	36	0	0	40	0	0	60	0	0	80	0	0
900	40	10	0	45	0	0	67	10	0	90	0	0
1,000	45	0	0	50	0	0	75	0	0	100	0	0



INTEREST TABLES

2. Table showing the interest on various amounts, at sundry percentages, for one calendar month.

RULE.—Multiply the amount by the rate per cent., and the product by the number of months, and divide the new product by 1,200.

Per Cent.

Amount	2			2½			3			3½			4		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
25	0	0	10	0	1	0½	0	1	3	0	1	5½	0	1	8
50	0	1	8	0	2	1	0	2	6	0	2	11	0	3	4
75	0	2	6	0	3	1½	0	3	9	0	4	4½	0	5	0
100	0	3	4	0	4	2	0	5	0	0	5	10	0	6	8
200	0	6	8	0	8	4	0	10	0	0	11	8	0	13	4
250	0	8	4	0	10	5	0	12	6	0	14	7	0	16	8
500	0	16	8	1	0	10	1	5	0	1	9	2	1	13	4
600	1	0	0	1	5	0	1	10	0	1	15	0	2	0	0
700	1	3	4	1	9	2	1	15	0	2	0	10	2	6	8
800	1	6	8	1	13	4	2	0	0	2	6	8	2	13	4
900	1	10	0	1	17	6	2	5	0	2	12	6	3	0	0
1,000	1	13	4	2	1	8	2	10	0	2	18	4	3	6	8

Amount	4½			5			7½			10		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
25	0	1	10½	0	2	1	0	3	1½	0	4	2
50	0	3	9	0	4	2	0	6	3	0	8	4
75	0	5	7½	0	6	3	0	9	4½	0	12	6
100	0	7	6	0	8	4	0	12	6	0	16	8
200	0	15	0	0	16	8	1	5	0	1	13	4
250	0	18	9	1	0	10	1	11	3	2	1	8
500	1	17	6	2	1	8	3	2	6	4	3	4
600	2	5	0	2	10	0	3	15	0	5	0	0
700	2	12	6	2	18	4	4	7	6	5	16	8
800	3	0	0	3	6	8	5	0	0	6	13	4
900	3	7	6	3	15	0	5	12	6	7	10	0
1,000	3	15	0	4	3	4	6	5	0	8	6	8

INTEREST TABLES

3. Table showing the interest on various amounts, at sundry percentages, for one day.

RULE.—Multiply the amount by the rate per cent., and the product by the number of days, and divide the new product by 36,500.

Per Cent.

Amount	2		2½		3		3½		4	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
£ 25	0	0¼	0	0¼	0	0¼	0	0½	0	0½
50	0	0¾	0	0¾	0	0¾	0	1¼	0	1¼
75	0	1¼	0	1¼	0	1¼	0	2¼	0	2¼
100	0	1¾	0	2	0	2	0	3¼	0	3¼
125	0	2¼	0	2½	0	2½	0	4¼	0	4¼
150	0	3	0	3¼	0	3¼	0	5¼	0	5¼
200	0	4	0	4½	0	4½	0	7¼	0	7¼
250	0	5	0	5½	0	5½	0	9¼	0	9¼
500	0	10	0	11	0	11	0	18¼	0	18¼
600	0	12	0	13½	0	13½	0	22¼	0	22¼
700	0	15	0	17	0	17	0	28¼	0	28¼
800	0	18	0	21	0	21	0	34¼	0	34¼
900	0	21	0	25½	0	25½	0	42¼	0	42¼
1,000	1	1	1	31	1	31	1	51	2	51

Amount	4½		5		7		10	
	s.	d.	s.	d.	s.	d.	s.	d.
£ 25	0	0½	0	0¾	0	1	0	1½
50	0	1¼	0	1¾	0	2¼	0	3¼
75	0	2¼	0	2¾	0	3¼	0	4¼
100	0	3	0	3¾	0	4¼	0	6
125	0	3¾	0	4½	0	5¼	0	8
150	0	4½	0	5¼	0	6¼	0	9¼
200	0	6	0	7	0	8¼	0	12
250	0	7½	0	8½	0	10	0	15
500	1	15	1	17	1	20	1	30
600	1	18	1	21	1	24	1	36
700	1	21	1	25½	1	28	1	42
800	1	24	1	30	1	32	1	48
900	1	27	1	34½	1	36	1	54
1,000	2	5	2	42	2	44	4	55



YEARLY RENT AND WAGES TABLE

Per Week		Per Year		Per Week		Per Year		Per Week		Per Year					
s.	d.	£	s.	d.	s.	d.	£	s.	d.	£	s.	d.			
1	0	2	12	0	8	0	20	16	0	0	18	0	46	16	0
1	3	3	5	0	8	3	21	9	0	0	18	6	48	2	0
1	6	3	18	0	8	6	22	2	0	0	19	0	49	8	0
1	9	4	11	0	8	9	22	15	0	0	19	6	50	14	0
2	0	5	4	0	9	0	23	8	0	1	0	0	52	0	0
2	3	5	17	0	9	3	24	1	0	1	2	6	58	10	0
2	6	6	10	0	9	6	24	14	0	1	5	0	65	0	0
2	9	7	3	0	9	9	25	7	0	1	7	6	71	10	0
3	0	7	16	0	10	0	26	0	0	1	10	0	78	0	0
3	3	8	9	0	10	3	26	13	0	1	15	0	91	0	0
3	6	9	2	0	10	6	27	6	0	2	0	0	104	0	0
3	9	9	15	0	10	9	27	19	0	2	5	0	117	0	0
4	0	10	8	0	11	0	28	12	0	2	10	0	130	0	0
4	3	11	1	0	11	3	29	5	0	3	0	0	156	0	0
4	6	11	14	0	11	6	29	18	0	3	10	0	182	0	0
4	9	12	7	0	11	9	30	11	0	4	0	0	208	0	0
5	0	13	0	0	12	0	31	4	0	4	10	0	234	0	0
5	3	13	13	0	12	3	32	10	0	5	0	0	260	0	0
5	6	14	16	0	13	0	33	16	0	5	10	0	286	0	0
5	9	14	19	0	13	3	35	2	0	6	0	0	312	0	0
6	0	15	12	0	14	0	36	8	0	6	10	0	338	0	0
6	3	16	5	0	14	3	37	14	0	7	0	0	364	0	0
6	6	16	18	0	15	0	39	0	0	7	10	0	390	0	0
6	9	17	11	0	15	3	40	6	0	8	0	0	416	0	0
7	0	18	4	0	16	0	41	12	0	8	10	0	442	0	0
7	3	18	17	0	16	3	42	18	0	9	0	0	468	0	0
7	6	19	10	0	17	0	44	4	0	9	10	0	494	0	0
7	9	20	3	0	17	3	45	10	0	10	0	0	520	0	0

MONTHLY AND WEEKLY TABLE FOR INCOME, RENT, OR EXPENSES.

Year	Per Month			Per Week			Year	Per Month			Per Week		
	£	s.	d.	£	s.	d.		£	s.	d.	£	s.	d.
5	0	8	4	0	1	11	65	5	8	4	1	5	0
6	0	10	0	0	2	3½	70	5	16	8	1	6	11
7	0	11	8	0	2	8½	75	6	5	0	1	8	10
8	0	13	4	0	3	1	80	6	13	4	1	10	9
10	0	16	8	0	3	10	85	7	1	8	1	12	8½
12	1	0	0	0	4	7¼	90	7	10	0	1	14	7¼
15	1	5	0	0	5	9	95	7	18	4	1	16	6¼
17	1	8	4	0	6	6¼	100	8	6	8	1	18	5½
20	1	13	4	0	7	8½	110	9	3	4	2	2	3½
22	1	16	8	0	8	5½	120	10	0	0	2	6	1
24	2	0	0	0	9	2½	130	10	16	8	2	10	0
25	2	1	8	0	9	7¼	140	11	13	4	2	13	10
27	2	5	0	0	10	4½	150	12	10	0	2	17	8½
30	2	10	0	0	11	6¼	160	13	6	8	3	5	6¼
35	2	18	4	0	13	5½	170	14	3	4	3	1	4½
40	3	6	8	0	15	4½	180	15	0	0	3	9	2½
45	3	15	0	0	17	3½	190	15	16	8	3	13	0¼
50	4	3	4	0	19	2½	200	16	13	4	3	16	11
55	4	11	8	1	1	1¼	250	20	16	8	4	16	1¼
60	5	0	0	1	3	0¼	300	25	0	0	5	15	4¼

FACTS ABOUT THE EARTH

DIMENSIONS

Equatorial Diameter .....	7,925,604 miles.
Polar Diameter .....	7,899,114 ..
Circumference on Equator.....	24,899,022 ..
Surface in Square Miles .....	196,900,143 ..
Weight in tons..	6,000,000,000,000,000,000



## TABLES OF WEIGHTS AND MEASURES

**Note.**—The grain in the three systems beneath is the same: the ounce Troy is the same as ounce Apothecaries—480 grains, but ounce Avoirdupois has 437½. The drachm Avoirdupois is less than half the drachm Apothecaries.

### AVOIRDUPOIS WEIGHT

16 Drachms (dr.)	1 Ounce	oz.
437½ Grains	1 Ounce	oz.
16 Ounces	1 Pound	lb.
7,000 Grains	1 Pound	lb.
28 Pounds	1 Quarter	qr.
4 Quarters	1 Hundredweight	cwt.
20 Hundredweights	1 Ton	ton

Drs.	Ozs.	Lbs.	St.	Qrs.	Cwt.	Ton
16	1					
256	16	1				
3,584	224	14	1			
7,168	448	28	2	1		
28,672	1,792	112	8	4	1	
573,440	35,840	2,240	160	80	20	1

Used for weighing common and heavy goods, and for all general purposes. A Stone (St.) = 14 lbs.

### TROY WEIGHT

24 Grains (gr.)	1 Pennyweight	dwt.
20 Pennyweights	1 Ounce	oz.

Used for weighing gold, silver, jewels, and precious stones.  
A Carat = 3.17 grains.

### APOTHECARIES WEIGHT

20 Grains (gr.)	1 Scruple	SCRUPL
3 Scruples	1 Drachm	
8 Drachms	1 Ounce	

Used in mixing medicines. But drugs are bought and sold by Avoirdupois weight.

## APOTHECARIES' FLUID MEASURE

60 Minims (m.)	1 Drachm (ʒ)
8 Drachms	1 Ounce (ʒ)
20 Ounces	1 Pint (O).
8 Pints	1 Gallon.
1 Drop	1 Grain.
60 Drops	1 Drachm.
1 Drachm	1 Tea-spoonful.
2 Drachms	1 Dessert-spoonful.
4 Drachms	1 Table-spoonful.
2 Ounces (ʒ)	1 Wine-glassful.
3 Ounces	1 Tea-cupful.

## LINEAL, SUPERFICIAL, AND SOLID MEASURES

### LINEAL OR LONG MEASURE

12 Inches (in.)	1 Foot	ft.
3 Feet	1 Yard	yd.
5½ Yards	1 Rod, pole, or perch	po.
40 Poles	1 Furlong	fur.
8 Furlongs	1 Mile	m.

In.	Ft.	Yds.	Po.	Fur.	M.
12	1				
36	3				
198	16½	5½	1		
7,920	660	220	40	1	
63,360	5,280	1,760	320	8	1

60 Geographical or 69¼ English miles = 1 Degree of Longitude (deg.); 360 Degrees = The Earth's Circumference O.



**OTHER LINEAL MEASURES**

3 Barleycorns	1 Inch.
4 Inches	1 Hand.
7.92 Inches	1 Link.
9 Inches	1 Span.
6 Feet	1 Fathom.
100 Fathoms	1 Cable length.
22 Yards	1 Chain.
100 Links	1 Chain.
10 Chains	1 Furlong
3 Miles	1 League.
6,080 Feet	1 Nautical Mile.

The inch may now be legally divided into 10, 12, or 16 equal parts. The hand is used in finding the height of horses; the fathom in finding the depths of water and mines; and the chain in measuring land.

**MILE MEASUREMENTS**

The English Statute Mile	= 1,760 yards.
The Scotch Mile	= 1,984 "
The Irish Mile	= 2,240 "
The Italian Mile	= 1,467 "
The Spanish Mile	= 5,028 "
The Austrian Mile	= 8,296 "
The Geographical or Nautical Mile	= 2,026 $\frac{3}{4}$ "
The Russian Verst	= 1,168 "
The Kilometre	= 1,092 "

**CLOTH MEASURE**

$\frac{1}{4}$ Inches ( <i>in.</i> )	1 Nail	<i>nl.</i>
Nails	1 Quarter	<i>qr.</i>
Quarters	1 Yard	<i>yd.</i>
Quarters	1 Ell	<i>ell</i>
Quarters	1 Flemish Ell	<i>Fl. Ell</i>
Quarters	1 French Ell	<i>Fr. Ell</i>

Used by drapers for measuring linens, woollens, uslins, ribands, etc.

**GUNTER'S CHAIN MEASURE (LINEAL)**

7.92 Inches	= 1 Link
100 Links, or 22 yards	= 1 Chain.
10 Chains	= 1 Furlong.
80 Chains	= 1 Mile.

Used in land surveying. The Chain is 66 feet long, and is divided into 100 parts called links. A chain of 100 feet is also used for surveying.

**GUNTER'S CHAIN MEASURE (SQUARE)**

144 Square Inches	= 2.295 Square Links.
20.655 Square Links	= 1 Square Yard.
625 Square Links	= 1 Square Pole.
10,000 Square Links	= 1 Square Chain.
25,000 Square Links	= 1 Rood.
100,000 Square Links	= 1 Acre.

**LAND OR SQUARE MEASURE**

144 Square Inches ( <i>sq.in.</i> )	1 Square Foot	<i>sq. ft.</i>
9 Square Feet	1 Square Yard	<i>sq. yd.</i>
30 $\frac{1}{4}$ Square Yards	1 Square Rod, Pole, Perch	<i>sq. po.</i>
40 Poles	1 Rood	<i>rd.</i>
4 Roods	1 Acre	<i>ac.</i>
640 Acres	1 Square Mile	<i>sq. m.</i>

Sq. In.	Sq. Ft.	Sq. Yds.	Sq. P'ch	Rood	Ac.
144	1				
1,296	9				
39,204	272 $\frac{1}{4}$	30 $\frac{1}{4}$	1		
1,568,160	10,890	1,210	40	1	
6,272,640	43,560	4,840	160	4	1

Used for measuring surfaces, and all things that have length and breadth.



## OTHER MEASURES

100	Square Feet	.....	=	1 square of flooring.
272½	Square Feet	.....	=	1 rod of brickwork.
30	Acres	.....	=	1 yard of land.
100	Acres	.....	=	1 hide of land.
40	Hides	.....	=	1 barony.

## CUBIC OR SOLID MEASURE

1,728	Cubic Inches ( <i> cub.in. </i> )	1	Cubic Foot.... <i> cub. ft. </i>
27	Cubic Feet	.....	1 Cubic Yard.... <i> cub. yd. </i>
40	Cubic Feet of round timber, or 50 Cubic Feet of hewn timber	.....	= 1 ton or load.
42	Cubic Feet	.....	= 1 ton of shipping.
108	Cubic Feet	.....	= 1 stack of wood.
128	Cubic Feet	.....	= 1 Cord of Wood.
277½	Cubic Inches of Water.	.....	= 1 Imperial Gallon.

## AREA AND VOLUMES

All the measurements must be made in the same unit, *i.e.*, if diameter is in inches the length must also be in inches, and areas will then be sq. inches, volumes in cub. inches.

*Triangle.—Area:* Draw a line from one corner at right-angles to the opposite side; measure the line and the opposite side; multiply these two together, and halve the result.

*Circle.—Circumference:* Multiply the diameter by  $\frac{22}{7}$  (3.1416).

*Area:* Multiply the diameter by itself, and the result by  $\frac{11}{14}$  (.7854), or multiply the square of the radius by  $\frac{22}{7}$  (3.1416).

*Cylinder.—Circumference* measured like circle.

*Area of end*                   "                   "                   "

*Area of sides* = circumference × length of side.

*Volume* = area of end × length of side.

TABLE OF THE SQUARES AND CUBES OF NUMBERS FROM 1 TO 50

The Square of		The Square of		The Cube of		The Cube of					
1	equals	1	26 equals	676	1	26 equals	17576				
2	"	4	27	"	729	2	"	827	"	19683	
3	"	9	28	"	784	3	"	27	28	"	21952
4	"	16	29	"	841	4	"	64	29	"	24389
5	"	25	30	"	900	5	"	125	30	"	27000
6	"	36	31	"	961	6	"	216	31	"	29791
7	"	49	32	"	1024	7	"	343	32	"	32768
8	"	64	33	"	1089	8	"	512	33	"	35937
9	"	81	34	"	1156	9	"	729	34	"	39304
10	"	100	35	"	1225	10	"	1000	35	"	42875
11	"	121	36	"	1296	11	"	1331	36	"	46656
12	"	144	37	"	1369	12	"	1728	37	"	50653
13	"	169	38	"	1444	13	"	2197	38	"	54872
14	"	196	39	"	1521	14	"	2744	39	"	59319
15	"	225	40	"	1600	15	"	3375	40	"	64000
16	"	256	41	"	1681	16	"	4096	41	"	68921
17	"	289	42	"	1764	17	"	4913	42	"	74088
18	"	324	43	"	1849	18	"	5832	43	"	79507
19	"	361	44	"	1936	19	"	6859	44	"	85184
20	"	400	45	"	2025	20	"	8000	45	"	91125
21	"	441	46	"	2116	21	"	9261	46	"	97336
22	"	484	47	"	2209	22	"	10648	47	"	103823
23	"	529	48	"	2304	23	"	12167	48	"	110592
24	"	576	49	"	2401	24	"	13824	49	"	117649
25	"	625	50	"	2500	25	"	15625	50	"	125000

If any of these squares and cubes are read backwards, the square roots  $\sqrt{\quad}$  and cube roots  $\sqrt[3]{\quad}$  may be found. Thus the  $\sqrt{2116}$  is 46, and the  $\sqrt[3]{97336}$  is 46.



## MEASURES OF CAPACITY.

The unit capacity is the *gallon*. The *Imperial Gallon* contains 277.274 cub. in. of distilled water at the temperature of 62° F., with the barometer standing at 30 inches, and weighs 10 lbs. of distilled water.

4 Gills ( <i>gi.</i> )	1 Pint	<i>pt.</i>
2 Pints	1 Quart	<i>qt.</i>
4 Quarts	1 Gallon	<i>gal.</i>
2 Gallons	1 Peck	<i>pk.</i>
4 Pecks	1 Bushel	<i>bush.</i>
8 Bushels	1 Quarter	<i>qr.</i>
36 Bushels	1 Chaldron	<i>chal.</i>

W

Gill	Pint	Quart	Gal.	Peck	Bush.	Qr.
4	1					
8	2	1				
32	8	4	1			
64	16	8	2	1		
256	64	32	8	4	1	
2,048	512	256	64	32	8	1

*Wheat, Corn, and Flour.*—A *Quarter* is a heaped measure of 8 bushels. A *Quarter* of English wheat is reckoned as 504 lbs. weight. On the Winnipeg Grain Market the standard *bushel* of Oats is reckoned equal to 34 lbs.; in the United States at 32 lbs.

## WINE MEASURE

4 Gills or Noggins	= 1 Pint	<i>pt.</i>
2 Pints	= 1 Quart	<i>qt.</i>
4 Quarts	= 1 Gallon	<i>gal.</i>
10 Gallons	= 1 Anker	<i>ank.</i>
18 Gallons	= 1 Runlet	<i>run.</i>
42 Gallons	= 1 Tierce	<i>tierce</i>
63 Gallons	= 1 Hogshead	<i>hhd.</i>
84 Gallons	= 1 Puncheon	<i>pun.</i>
126 Gallons	= 1 Pipe or Butt	<i>pipe</i>
252 Gallons	= 1 Tun	<i>tun</i>

All Pipes of Wine do not contain 126 gallons.

## WINE MEASURE —continued

A Pipe of Maderia	contains	92 Gallons
A Pipe of Cape Wine	„	92 „
A Pipe of Sherry	„	108 „
A Pipe of Brandy	„	114 „
A Pipe of Port Wine	„	115 „

All wines, spirits, cider, perry and vinegar are dealt with by this measure.

A bottle of wine or spirits should contain  $\frac{1}{2}$  gallon, or nearly a pint and a half.

## ALE AND BEER MEASURE

2 Pints	= 1 Quart	<i>qt.</i>
4 Quarts	= 1 Gallon	<i>gal.</i>
9 Gallons	= 1 Firkin	<i>fir.</i>
18 Gallons	= 1 Kilderkin	<i>kil.</i>
36 Gallons	= 1 Barrel	<i>bar.</i>
54 Gallons	= 1 Hogshead	<i>hhd.</i>
2 Barrels	= 1 Puncheon	<i>pun.</i>
3 Barrels	= 1 Butt	<i>butt</i>

Ale and Beer are also sold in  $4\frac{1}{2}$  Gallon casks, and in Quart, Pint, and Half-pint bottles.

## MISCELLANEOUS TABLES

## WOOL WEIGHT

7 Pounds	= 1 Clove	<i>cl.</i>
2 Cloves	= 1 Stone	<i>st.</i>
2 Stones	= 1 Tod	<i>tod</i>
$6\frac{1}{2}$ Tods	= 1 Wey	<i>wey</i>
2 Weys	= 1 Sack	<i>sk.</i>
12 Sacks	= 1 Last	<i>last</i>
240 Pounds	= 1 Pack	<i>pk.</i>



### HAY AND STRAW WEIGHT

36 Pounds.....	1 Truss of straw .....	<i>tr.</i>
56 Pounds.....	1 Truss of old hay ...	<i>tr.</i>
30 Pounds.....	1 Truss of new hay ...	<i>tr.</i>
36 Trusses.....	1 Load .....	<i>ld.</i>

- 1 Load of straw weighs 11 cwts. 2 qrs. 8 lbs.  
 1 Load of old hay weighs 18 cwts.  
 1 Load of new hay weighs 19 cwts. 1 qr. 4 lbs.

### BREAD AND FLOUR WEIGHT

	Lbs.	ozs.	drs.
A Peck Loaf weighs .....	17	6	2
A Half-peck Loaf weighs .....	8	11	1
A Quartern Loaf weighs .....	4	5	8½
A Quartern (or Quarter-peck) of Flour .....	3	8	0
A Peck or Stone of Flour weighs .....	14	0	0
A Bushel or 4 Pecks of Flour weighs .....	56	0	0
Five Bushels or a sack of Flour weighs .....	280	0	0

Bread is now sold in 4 lb. and 2lb. loaves. The baker is obliged to weigh bread at the time of purchase, and forbidden to sell it by the Peck or Quartern.

### MEASURES OF TIME

#### TIME TABLE

60 Seconds ( <i>sec.</i> ) .....	1 Minute ( <i>min.</i> )
60 Minutes .....	1 Hour ( <i>hr.</i> )
24 Hours .....	1 Day ( <i>dy.</i> )
7 Days .....	1 Week ( <i>wk.</i> )
4 Weeks.....	1 Lunar Month
13 Lunar Months	}... 1 Year
12 Calendar Months, or	
365 Days	}... 1 Leap Year
366 Days .....	
10 Years .....	1 Decade
100 Years .....	1 Century

### TIME TABLE

Secs.	Mins.	Hours	Days	Weeks	Lunar Month
60	1				
3,600	60	1			
86,400	1,440	24	1		
604,800	10,080	168	7	1	
2,419,200	40,320	672	28	4	1

- A Solar Day ..... = 24 hours.  
 A Lunar Day ..... = 23 hrs. 48 mins.  
 A Julian Year ..... = 365 days 6 hours.  
 A Solar Year ..... = 365 days 5 hrs. 48 mins. 57 secs.

### THE NUMBER OF DAYS IN EACH CALENDAR MONTH

January .....	31	May .....	31	September ...	30
*February ....	28	June .....	30	October .....	31
March .....	31	July .....	31	November....	30
April .....	30	August .....	31	December ...	31

\*In leap years, 29.

*Thirty days hath September,  
 April, June, and November;  
 February hath twenty-eight alone,  
 And all the rest have thirty-one;  
 Except in leap-year, then's the time  
 When February's days are twenty-nine.*

Leap Year is found by dividing the year by 4; or by dividing a century as 1700, 1800, 1900, 2000 by 400. If there be no remainder, the year or century so divided is a leap year. Thus the year 1936 will divide by 4 without a remainder, and will be a leap year. The year 1900, though divisible by 4 without a remainder, was not divisible by 400 without a remainder, and was not, therefore, a leap year.



## THE ANCIENT HOUR

The early Egyptians divided the day and night each into 12 hours, a custom adopted by the Jews or Greeks probably from the Babylonians. The day is said to have first been divided into hours from B.C. 293, when a sun-dial was erected in the temple of Quirinus at Rome. Previous to the invention of water-clocks, B.C. 158, the time was called at Rome by public criers. In early England one expedient for measuring time was by wax candles, three inches burning an hour. The first perfect mechanical clock was not made until about A.D. 1250. Day began at sunrise among most of the Northern nations, at sunset among the Jews and Athenians, and at midnight among the Romans, as with us.

## THE SEASONS

Spring Commences	September 23rd.	( <i>Vernal Equinox</i> ).
Summer	December 22nd	( <i>Summer Solstice</i> ).
Autumn	March 21	( <i>Autumn Equinox</i> ).
Winter	June 21st	( <i>Winter Solstice</i> ).

The longest day of the year is December 22nd, and the shortest June 21st.

A Table showing the number of days from any day of one month, to the same day of any other month.

If the end of February be in the time, and it is leap-year, one day must be added.

To	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
From January	365	31	59	90	120	151	181	212	243	273	304	334
February	334	365	28	59	89	120	150	181	212	242	273	303
March	306	337	365	31	61	92	122	153	184	214	245	275
April	275	306	334	365	30	61	91	122	153	183	214	245
May	245	276	304	335	365	31	61	92	123	153	184	214
June	214	245	273	304	334	365	30	61	92	122	153	183
July	184	215	243	274	304	335	365	31	62	92	122	153
August	153	184	212	243	273	304	334	365	31	61	92	122
Sept.	122	153	181	212	242	273	303	334	365	30	61	91
October	92	123	151	182	212	243	273	304	335	365	31	61
Nov.	61	92	120	151	181	212	242	273	304	334	365	30
December	31	62	90	121	151	182	212	243	274	304	335	365

## THE ANCIENT AND MODERN YEAR

The Athenians began the year in June, the Macedonians in September, the Romans first in March and afterwards in January, the Persians on August 11th, the ancient Mexicans on February 23rd, the Mohammedans in July. The Chinese year, which begins early in February, is similar to the Mohammedan in having 12 months of 29 and 30 days alternately; but in every nineteen years there are seven years which have 13 months. This is not quite correct, and the Chinese have therefore formed a cycle of 60 years, in which period 22 inter-calary months occur.

## TO FIND LONGITUDE BY TIME

The Earth makes a journey through 360 degrees in every 24 hours, which gives 15° in one hour. All time in England is regulated by Greenwich time, and 12 o'clock at noon at Greenwich is the standard by which all English time is arranged. A person travelling from England to a place 15° E. would find that the clocks and watches there were all registering 1 o'clock p.m., while it was only 12 o'clock by his watch, and that his watch was an hour slow. If he travelled 15° W. he would find that his watch was fast, and that while it was 12 o'clock by his watch, the time of the day there would be only 11 o'clock. By allowing an hour of time for every 15° passed over, it is possible to ascertain the correct time at any place in the world.

## DUODECIMAL TABLE

### FOR CROSS MULTIPLICATION.

12 Fourths (""")	.....	1 Third ("").
12 Thirds	.....	1 Second (").
12 Seconds	.....	1 Inch (').
12 Inches	.....	1 Foot.

## GEOMETRICAL TABLE

### FOR CIRCULAR AND ANGULAR MEASURING.

60 Seconds (")	.....	1 Minute (').
60 Minutes	.....	1 Degree (°).
30 Degrees	.....	1 Sign.
60 Degrees	.....	1 Sextant.
90 Degrees	.....	1 Quadrant.
360 Degrees	.....	1 Circle or Circumference.



## MEASURES OF HEAT

The temperature of things is measured by an instrument called the *Thermometer*, of which there are three kinds :

- (1) **Centigrade Thermometer.**—Freezing-point marked 0°, and boiling-point 100°.
- (2) **Reaumur's Thermometer.**—Freezing-point marked 0°, and boiling-point 80°.
- (3) **Fahrenheit's Thermometer.**—Freezing-point marked 32°, and boiling-point 212°.

## COMPARISON OF SCALES

Fahrenheit	Centigrade	Reaumur
*212	*100	*80
200	93.6	71.6
180	82.2	65.7
160	71.1	56.8
140	60	48
120	48.8	39.1
100	37.8	30.2
90	32.2	25.7
80	26.6	21.3
70	21	16.8
60	15.5	12.4
50	10	8
40	4.4	3.5
†32	†0	†0

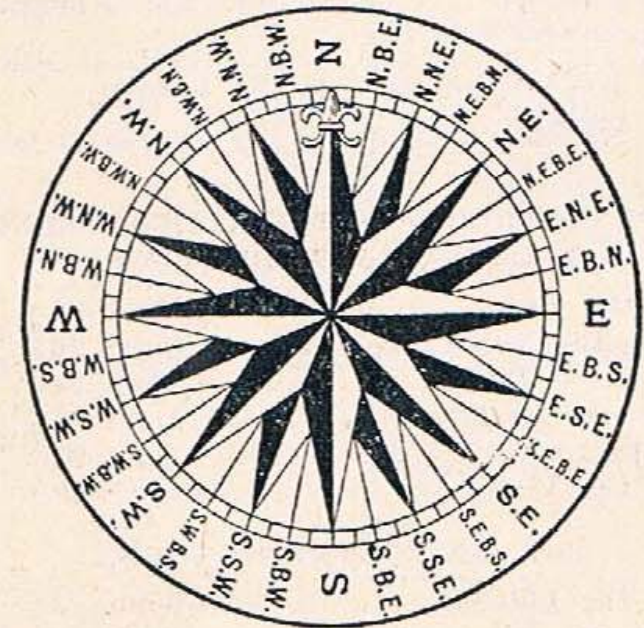
\*Boiling-point.                      †Freezing-point.

The Centigrade Thermometer is most widely used, but in England, N. America, etc., Fahrenheit's is used for general purposes; in Germany, Reaumur's. For strictly scientific purposes the Centigrade is now universally used.

## FREEZING- AND BOILING-POINTS

Substances	Degrees Fahr.	Degrees Cent.	Degrees Reaum.
Olive Oil freezes at.....	50	10	8
Rose Oil freezes at .....	60	15.5	12.4
Water freezes at .....	32	0	0
Alcohol boils at .....	173.1	74.4	59.5
Quicksilver boils at .....	680	360	288
Water boils at .....	212	100	80

## THE MARINER'S COMPASS



North, South, East, and West are terms used to express the relative positions of places to one another. They are the four *Cardinal Points* of the compass—an instrument used to determine the respective bearings of places. There are altogether thirty-two points of the compass—twenty-eight of



### RELATIVE SOLAR TIME AT PLACES WHEN IT IS NOON AT GREENWICH

#### 1.—OF PLACES EAST OF GREENWICH.

Places	Time when it is noon at Greenwich		Longitude °
	H.	M. P.M.	
Adelaide .....	9	14	138½
Aden .....	3	0	45
Alexandria .....	1	59	30
Amsterdam .....	12	19	4½
Berlin .....	12	54	13½
Berne .....	12	30	7½
Bombay .....	4	51	73
Cairo .....	2	5	31
Calcutta .....	5	53	88
Cape Town .....	1	12	18
Constantinople (Istanbul) .....	1	56	29
Durban .....	2	2	30½
Florence .....	12	44	11
Geneva .....	12	24	6
Hamburg .....	12	39	10
Johannesburg .....	1	56	29
Khartum .....	2	9	32½
Leningrad .....	2	1	30
Lyons .....	12	19	4½
Malta .....	12	58	14½
Melbourne .....	9	40	145
Moscow .....	2	30	37½
Naples .....	12	57	14
Odessa .....	2	2	30½
Paris .....	12	10	2½
Peking .....	7	46	116½
Pretoria .....	1	54	28½
Rome .....	12	49	12½
Sydney .....	10	5	151
Trieste .....	12	56	14
Vienna .....	1	6	16½
Zanzibar .....	2	37	39

### RELATIVE SOLAR TIME AT PLACES WHEN IT IS NOON AT GREENWICH

#### 2.—OF PLACES WEST OF GREENWICH.

Places	Time when it is noon at Greenwich		Longitude °
	H.	M. A.M.	
Albany (N.Y.) .....	7	4	74
Baltimore .....	6	54	76
Boston .....	7	16	70½
Buenos Aires .....	8	8	58
Callao .....	6	48	78
Chicago .....	6	8	88
Dublin .....	11	35	6½
Edinburgh .....	11	47	3½
Fredericton .....	7	36	66½
Gibraltar .....	11	39	5½
Glasgow .....	11	43	4½
Havana .....	6	31	82
Lisbon .....	11	23	9½
Madrid .....	11	45	3½
Monte Video .....	8	16	56
Montreal .....	7	4	74
New Orleans .....	6	0	90
New York .....	7	4	74
Ottawa .....	6	56	76
Pernambuco .....	9	40	35
Philadelphia .....	7	0	75
Quebec .....	7	15	71
Rio de Janeiro .....	9	8	43
Saint John (N.B.) .....	7	36	66
San Francisco .....	3	52	122
Toronto .....	6	44	79
Trinidad .....	7	54	61½
Valparaiso .....	7	16	71
Washington .....	6	52	77
Winnipeg .....	5	32	97



Dr Watts's metrical arrangement of these signs will enable us easily to recollect their names and order.

"The ram, the bull, the heavenly twins,  
And next the crab, the lion shines,  
The Virgin and the Scales,  
The scorpion, archer, and he-goat,  
The man that holds the waterpot,  
And fish with glittering tails."

TABLE OF THE PLANETS

Names	Distance from Sun	Length of diameter	Time in
			goinground the Sun
	Miles	Miles	Days
Mercury .....	35,392,000	3,030	88
Venus .....	66,131,500	7,700	225
Earth .....	91,430,200	7,913	365½
Mars .....	139,312,200	4,230	687
Jupiter .....	475,693,100	86,390	4,333
Saturn .....	872,134,600	71,900	10,759
Uranus .....	1,753,851,000	31,900	30,687
Neptune .....	2,746,271,200	32,900	60,127
*New Planet ..	4,185,000,000		

\*Discovered January, 1930.

SPECIFIC GRAVITIES, WATER BEING 1.000

Platinum .....	20.98	Lignum Vitæ ...	1.220
Gold .....	19.26	Green Heart .....	1.000
Mercury .....	13.57	English Oak .....	.934
Lead .....	11.35	Red Pine .....	.657
Silver .....	10.74	Cork .....	.240
Copper .....	8.89	Alcohol .....	.792
Iron, Cast .....	7.25	Carbonic Acid Gas.	.00176
Iron, Wrought .....	7.79	Oxygen Gas .....	.00137
Tin .....	7.30	Air .....	.00128
Zinc .....	7.00	Nitrogen Gas .....	.00120
Ebony .....	1.250	Hydrogen Gas ...	.00096

Platinum is the heaviest known substance.

The number being intermediate between the four cardinal points. The point lying midway between north and east is called *North-East*; that midway between north and west is called *North-West*. In like manner, the points lying midway between the east and west and the south points are called *South-East* and *South-West*.

These points are sometimes called the four Collateral Points. The *Cardinal Points* are generally abbreviated thus: N., S., E., W. The *Collateral Points* thus: N.E., N.W., S.E., S.W.

NAUTICAL MEASURE

6 Feet .....	make	1 Fathom.
100 Fathoms .....	"	1 Cable's length.
1,013½ Fathoms, or	}	1 Nautical Mile.
2,026¾ Yards		
3 Nautical miles	"	1 League.
20 Leagues, or	}	1 Degree of latitude.
60 Nautical miles		

EXPLANATION OF ASTRONOMICAL SIGNS  
THE SIX NORTHERN SIGNS:

♈ ♉ ♊ ♋ ♌ ♍	Aries, the Ram .....	March 21	} SPRING SIGNS
	Taurus, the Bull .....	April 20	
	Gemini, the Twins .....	May 21	} SUMMER SIGNS
	Cancer, the Crab .....	June 21	
	Leo, the Lion .....	July 23	
	Virgo, the Virgin .....	August 23	

THE SIX SOUTHERN SIGNS:

♎ ♏ ♐ ♑ ♒ ♓	Libra, the Balance .....	Sept. 23	} AUTUMN SIGNS
	Scorpio, the Scorpion .....	Oct. 23	
	Sagittarius, the Archer .....	Nov. 20	} WINTER SIGNS
	Capricornus, the Goat .....	Dec. 21	
	Aquarius, the Water-bearer .....	Jan. 20	
	Pisces, the Fishes .....	Feb. 18	



### THE METRIC SYSTEM OF WEIGHTS AND MEASURES

Used in France, Belgium, Norway, Germany, Austria, Portugal, Spain, Italy, and several other countries, and under different names in Holland and Greece. The system is also legal, though not compulsory, in England and the United States.

It was established in France in 1801. The Metre, which gives the name to the system, is the basis from which all other measurements are derived, and the unit of length. It is the ten-millionth part of the distance between the Equator and either Pole, and measures 39·37011 English inches.

In the metric or decimal system a convenient measure or weight is taken as the unit; all other weights or measures are multiples or sub-multiples (decimal parts) of the unit.

To indicate multiples of the unit, four Greek reflexes are used, viz.: Deka, Hekto, Kilo, and Myria.

Deka	signifies	10	times the unit.
Hekto	„	100	„
Kilo	„	1,000	„
Myria	„	10,000	„

To indicate sub-multiples, or parts of the unit, three Latin prefixes are used, viz.: Deci, Centi, and Milli.

Deci	signifies	$\frac{1}{10}$	of the unit.
Centi	„	$\frac{1}{100}$	„
Milli	„	$\frac{1}{1000}$	„

The Unit of Linear Measure is the Metre = 39·37011 in.  
 „ Square Measure „ Are = sq. Dekametre.  
 „ Cubic Measure „ Stère = cubic Metre.  
 „ Weight Measure „ Gramme = cu. Centimetre of water.  
 „ Capacity Measure „ Litre = cu. Decimetre.

The Unit of Linear Measure is the Metre = 39·37011 in.  
 „ Square Measure is the Are = a square Dekametre.  
 „ Cubic Measure is the Stère = a cubic Metre.  
 „ Weight Measure is the Gramme = a cubic Centimetre of water.  
 „ Capacity Measure is the Litre = a cubic Decimetre

### METRIC WEIGHTS AND MEASURES LINEAR MEASURE

The Metre is the Unit.

			Eng. Inch
10 Millimetres	..... = 1 Centimetre	... =	·3937
10 Centimetres	..... = 1 Decimetre	.... =	3·937
10 Decimetres	..... = 1 Metre	..... =	39·37
10 Metres	..... = 1 Dekametre	... =	393·7
10 Dekametres	..... = 1 Hectometre	.. =	3937·01
10 Hectometres	..... = 1 Kilometre	... =	39370·1
10 Kilometres	..... = 1 Myriametre	.. =	393701·1

The Land Chain is one Dekametre in length, or 10 yards  $2\frac{1}{2}$  inches. It is divided into 50 Links, each two Decimetres, or about  $7\frac{1}{2}$  inches in length.

Long distances are expressed in Kilometres.

### METRIC TO BRITISH MEASURE

	Metres	M.	Fur.	Yds.	Ft.	In.
A Millimetre	= $\frac{1}{1000}$	= ..	..	..	..	·03937
A Centimetre	= $\frac{1}{100}$	= ..	..	..	..	·3937
A Decimetre	= $\frac{1}{10}$	= ..	..	..	..	3·937
A Metre	= 1	= ..	..	1	0	3·37
A Dekametre	= 10	= ..	..	10	2	9·69
A Hectometre	= 100	= ..	..	109	1	·07
A Kilometre	= 1,000	= ..	4	213	1	7·9
A Myriametre	= 10,000	= 6	1	156	0	7·2

### SQUARE MEASURE

The Are is the Unit.

			Eng. sq.yds.
10 Centiares	..... = 1 Deciare	..... =	11·96033
10 Deciares	..... = 1 Are	..... =	119·6033
10 Ares	..... = 1 Dekare	..... =	1196·033
10 Dekares	..... = 1 Hektare	..... =	11960·33

The Are = 1 square Dekametre = 100 square Metres.

In the following tables the multiples are 100, and not 10; and the sub-multiples, or parts, are  $\frac{1}{100}$  and not  $\frac{1}{10}$ .



### The Square Metre is the Unit.

100 Sq. Millimetres	= 1 Sq. Centimetre	= .155 sq. in.
100 Sq. Centimetres	= 1 Sq. Decimetre	= 15.5 sq. in.
100 Sq. Decimetres	= 1 Sq. Metre	= 10.76 sq. ft.
100 Sq. Metres	= 1 Sq. Dekametre	= 119.5 sq. yds.
100 Sq. Dekametres	= 1 Sq. Hektometre	= 2 ac. 1 ro. 35 po.
100 Sq. Hektometres	= 1 Sq. Kilometre	= 246ac. 3ro. 20po.

### METRIC TO BRITISH MEASURE

	Ares.	Ac.	Ro.	Po.	S.	yds	S.	ft.	S.	Ins
A Centiare	= $\frac{1}{100}$	= ..	..	..	1	1	110			
A Deciare	= $\frac{1}{10}$	= ..	..	..	11	8	92			
An Are	= 1	= ..	..	3	28	7	92			
A Dekare	= 10	= ..	..	39	16	2	67			
A Hektare	= 100	= 2	1	35	11	4	58			

### CUBIC MEASURE

#### The Stère is the Unit

10 Decistères	.... = 1 Stère	..... = 35.315 cubic feet.
10 Stères	..... = 1 Dekastère	. = 353.15 cubic feet.

The Stère = 1 Cubic Metre = 35.315 cubic feet.

In the following table the multiples are 1,000, and the sub-multiples  $\frac{1}{1000}$ .

1,000 Cub. Millimetres	= 1 Cub. Centimetre	= .06002 c. in.
1,000 Cub. Centimetres	= 1 Cub. Decimetre	= 60.02 c. in.
1,000 Cub. Decimetres	= 1 Cub. Metre	35.317 c. ft.

### METRIC TO BRITISH MEASURE

	Stère	C. yds.	C. ft.	C. in.
A Decistère	= $\frac{1}{10}$	= ..	6	918
A Stère	= 1	= ..	35	540
A Dekastère	= 10	= 13	2	216

### LIQUID MEASURE

#### The Litre is the Unit

		Eng. Pts.
10 Centilitres	= 1 Decilitre	..... = 17.598
10 Decilitres	= 1 Litre	..... = 1.7598
10 Litres	= 1 Dekalitre	.. = 17.598
10 Dekalitres	= 1 Hektolitre	.. = 175.98
10 Hektolitres	= 1 Kilolitre	... = 1759.8
10 Kilolitres	= 1 Myrialitre	.. = 17598.

The unit, the Litre = 1 Cub. Decimetre, so that 1 Kilolitre = 1 Cub. Metre or 1 Stère.

### METRIC TO BRITISH MEASURE

	Litres	Pints	Gals.	Qts.	Pts.
A Centilitre	.. = $\frac{1}{100}$	= .0176	= ..	..	..
A Decilitre	... = $\frac{1}{10}$	= .176	= ..	..	..
A Litre	..... = 1	= 1.76	= ..	..	1.76
A Dekalitre	.. = 10	= 2.2 Gals.	= 2	0	1.6
A Hektolitre	. = 100	= 22 "	= 22	0	0
A Kilolitre	... = 1,000	= 220 "	= 220	0	0
A Myrialitre	.. = 10,000	= 2,200 "	= 34	375	Qrs.

### WEIGHT

#### The Gram is the Unit

	Eng. Grains	Eng. drams
10 Milligrams	= 1 Centigram	= .154 = .0056
10 Centigrams	= 1 Decigram	= 1.543 = .0564
10 Decigrams	= 1 Gram	= 15.432 = .5643
10 Grams	= 1 Dekagram	= 154.323 = 5.6438
10 Dekagrams	= 1 Hektogr'm	= 1543.234 = 56.438
10 Hektogr'ms	= 1 Kilogram	= 15432.348 = 564.38
10 Kilograms	= 1 Myriagram	= 154323.48 = 5643.8
10 Myriagr'ms	= 1 Quintal	= 1543234.8 = 56438.
10 Quintals	= 1 Millier	= 15432348. = 564380.

∴ The unit, the Gram, is the weight of a Cub. Centimetre of water, at its greatest density, 4° C. or 39° F.

1,000 Kilos. = 2204.6 lbs. = 1 Metric Ton.

### METRIC TO BRITISH MEASURE

	Gram	Avoirdupois Cwt. qrs. lbs. ozs.	Troy Lbs. ozs. dwts.	grains
A Milligram	= $\frac{1}{1,000}$	= ..	..	..
A Centigram	= $\frac{1}{100}$	= ..	..	..
A Decigram	= $\frac{1}{10}$	= ..	..	..
A Gram	= 1	= ..	..	..
A Dekagram	= 10	= ..	..	..
A Hektogram	= 100	= ..	..	..
A Kilogram	= 1,000	= ..	..	..
A Myriagram	= 10,000	= ..	..	..
A Quintal	= 100,000	= 1 3 24 7 6	= 26 9 10 3	
A Millier	= 1,000,000	= 19 2 20 9 12	= 2,679 2 12 12	



## RULES FOR CONVERTING METRIC TO ENGLISH MEASURES AND WEIGHTS

To Convert	<i>grams to oz. avoird.</i>	multiply by 20	divide by 567
„	kilograms to lbs.	„ 1000	„ 454
„	litres to gals.	„ 22	„ 100
„	litres to pints	„ 88	„ 50
„	millimetres to ins.	„ 10	„ 254
„	metres to yds.	„ 70	„ 64

## BRITISH MEASURES TO METRIC

### AVOIRDUPOIS WEIGHT

1 Dram	..... =	1.772	Grams.
1 Ounce	..... =	28.352	Grams.
1 Pound	..... =	4.536	Hektograms.
1 Stone	..... =	6.35	Kilograms.
1 Quarter	..... =	12.7	Kilograms.
1 Cwt.	..... =	50.8	Kilograms.
1 Ton	..... =	1.016	Metric Tons.

### TROY WEIGHT

1 Grain	..... =	.0648	Gram.
1 Pennyweight	... =	1.5552	Grams.
1 Ounce	..... =	31.104	Grams.
1 Pound	..... =	373.248	Grams.

### APOTHECARIES WEIGHT

1 Grain	..... =	.0648	Gram.
1 Scruple	..... =	1.296	Grams.
1 Drachm	..... =	3.888	Grams.
1 Ounce	..... =	31.104	Grams.
1 Pound	..... =	373.248	Grams.

### LINEAL MEASURE

1 Inch	..... =	2.54	Centimetres.
1 Foot	..... =	3.048	Decimetres.
1 Yard	..... =	9.144	Decimetres.
1 Pole	..... =	5.0292	Metres.
1 Chain	..... =	20.1168	Metres.
1 Furlong	..... =	2.0116	Hektometres.
1 Mile	..... =	1.6092	Kilometres.

## SQUARE MEASURE

1 <sup>7</sup> / <sub>8</sub> Square Inch	..... =	6.4516	Square Centimetres.
1 Square Foot	..... =	9.2903	Square Decimetres.
1 <sup>5</sup> / <sub>8</sub> Square Yard	..... =	.8361	Square Metre.
1 Square Perch	..... =	25.292	Square Metres.
1 <sup>7</sup> / <sub>8</sub> Rood	..... =	10.1168	Square Dekametres.
1 Acre	..... =	40.4472	Square Dekametres.
1 <sup>1</sup> / <sub>2</sub> Square Mile	..... =	2.5885	Square Kilometres.

## CUBIC MEASURE

1 Cubic Inch	..... =	16.388	Cubic Centimetres.
1 Cubic Foot	..... =	28.318	Cubic Decimetres.
1 Cubic Yard	..... =	.764	Cubic Metre.

## MEASURES OF CAPACITY

### APOTHECARIES MEASURE

1 Minim	..... =	.059	Cubic Cm.
1 Fluid Drachm	... =	3.552	Cubic Cms.
1 Fluid Ounce	.... =	2.84	Centilitres.
1 Pint	..... =	.5681	Litre.
1 Gallon	..... =	4.5459	Litres.

### LIQUID MEASURE

1 Gill	..... =	.142	Litre.
1 Pint	..... =	.568	Litre.
1 Quart	..... =	1.136	Litres.
1 Gallon	..... =	4.546	Litres.

### DRY MEASURE

1 Peck	..... =	9.088	Litres.
1 Bushel	..... =	3.635	Dekalitres.
1 Quarter	..... =	2.908	Hektolitres.

## UNITED STATES MEASURES

The Weights and Measures of the U.S.A. are as those of Great Britain, with the following exceptions:

The "long ton" = 2,240 lbs.; the "short ton," 2,000 lbs.

The old bushel (grain) = 2,150.42 cubic inches.

Its gallon = 268.8 cubic inches.

The old wine gallon = 231 cubic inches, and is divided into 8 pints.



## SCRIPTURE WEIGHTS AND MEASURES

### HEBREW WEIGHTS IN ENGLISH TROY WEIGHT

	Lbs.	Ozs.	Dwts.	Grs.
Gerah .....	0	0	0	12
Bekah .....	0	0	5	0
Shekel .....	0	0	10	0
Maneh (60 shekels) .....	2	6	0	0
Talent of Silver (3,000 shekels) ...	125	0	0	0
Talent of Gold (6,000 shekels) ....	250	0	0	0

### MEASURES OF LENGTH

	Mls.	Yds.	Ft.	Ins
Digit or Finger .....	0	0	0	0.912
Palm .....	0	0	0	3.648
Span .....	0	0	0	10.944
Cubit .....	0	0	1	9.888
Fathom .....	0	0	7	3.552
Ezekiel's reed (1½ fathoms).....	0	0	10	11.328
Arabian Pole .....	0	0	14	7.104
Measuring line (10 Arabian Poles) .	0	48	1	11.04
Stadium or Furlong .....	0	243	0	6
Sabbath day's journey .....	0	1,216	0	0
Day's journey.....	33	288	0	0

### LIQUID MEASURE

	Gals.	Pts.
Caph .....	0	0.625
Log .....	0	0.833
Cab .....	0	3.333
Hin .....	1	2
Seah .....	2	4
Bath or Ephah .....	7	4
Homer .....	75	5

### DRY MEASURE

	Pks.	Gal.	Pts.
Gachal.....	0	0	0.1416
Cab .....	0	0	2.833
Omer .....	0	0	5.1
Seah .....	1	0	1
Ephah .....	3	0	3
Letch .....	16	0	0
Homer.....	32	0	0

## MONEY TABLE—NEW TESTAMENT

	£	s.	d.		£	s.	d.
Lepton or Mite..	0	0	0 $\frac{1}{2}$	Denarion.....	0	0	7 $\frac{1}{2}$
Kondrantes (tr. "farthing")	0	0	0 $\frac{1}{4}$	Drachme .....	0	0	7 $\frac{1}{2}$
Assarion (also tr. "farthing")	0	0	0 $\frac{1}{2}$	Didrachmon ...	0	1	3
As .....	0	0	0 $\frac{1}{2}$	Stater .....	0	3	0
Quadrans .....	0	0	0 $\frac{1}{4}$	Argurion .....	0	2	6
				Mna (or mina)abt.	3	0	0
				Telanton .....	190	0	0

### MEASURES OF TIME

The *Day* was always reckoned from sunset to sunset, thus the Jewish Sabbath extends from sunset on Friday to sunset on Saturday. In Old Testament times the day was divided into three parts; in the New Testament, day and night were each divided into *hours* ("Are there not twelve hours in the day," John xi. 9—"The third hour of the night," Acts xxiii. 23), but, most generally into *watches* of which there were four—no doubt a Roman innovation.

### WATCHES

The *First Watch* was from sunset to the third hour of the night. From 6 to 9 p.m.

The *Second* or *Middle Watch* was the third hour to the sixth. From 9 to 12 p.m.

The *Third Watch*, or *Cock-crowing*, was from the sixth hour to the ninth. From 12 to 3 a.m.

The *Fourth Watch* was from the ninth hour to sunrise. From 3 to 6 a.m.

### THE JEWISH OR MOSAIC YEAR

The Jewish Ecclesiastical or Mosaic Year was divided into twelve months, viz.

	Part of		Part of
1. Nisan or Abib .	March & April	7. Tisri or Ethanin	Sept. Oct.
2. Zif or Ijar ....		8. Marchesvan or Bul. ....	
3. Sivan .....	May	9. Chisleu .....	Nov. Dec.
4. Thammuz ....	June	10. Thebet .....	Dec. Jan.
5. Ab. ....	July	11. Sebat .....	Jan. Feb.
6. Elul.....	August	12. Adar .....	Feb. March



## PAPER TABLES

24 Sheets .....	1 Quire.	20 Sheets 1 Quire outsides.
20 Quires .....	1 Ream.	25 " 1 " printers.
2 Reams .....	1 Bundle.	43 Quires 1 Bundle "
5 Bundles .....	1 Bale	60 Skins or 5 doz. 1 Roll of parchment.

## SIZES OF PRINTING PAPER

	In.	In.		In.	In.
Foolscap .....	13½	× 17	Double Foolscap	17	× 27
Crown .....	15	× 20	Large Post ...	16½	× 21
Post .....	15¼	× 19	Double Crown .	20	× 30
Demy .....	17½	× 22½	Double Demy .	22½	× 35
Royal .....	20	× 25	Quad Crown ..	30	× 40
Imperial .....	22	× 30	Quad Demy ...	35	× 45

## SIZES OF DRAWING PAPER

	In.	In.		In.	In.
Emperor .....	72	× 48	Royal .....	24	× 19
Antiquarian ...	53	× 31	Medium .....	22	× 17½
Double Elephant	40	× 26¼	Large Post ...	21	× 16½
Atlas .....	34	× 26	Copy .....	20	× 16
Colombier .....	34½	× 23½	Demy .....	20	× 15½
Imperial .....	30	× 22	Post .....	19	× 15¼
Elephant .....	28	× 23	Foolscap .....	16¼	× 13¼
Super Royal ...	27	× 19	Pott .....	15	× 12½

## SIZES OF BOOKS

Fo. ..	Folio .....	Sheet folded into 2 leaves or 4 pages.
4to ..	Quarto .....	4 " 8 "
8vo ..	Octavo .....	8 " 16 "
12mo ..	Duodecimo ..	12 " 24 "
16mo ..	Sexodecimo ..	16 " 32 "
18mo ..	Octodecimo ..	18 " 36 "
24mo, 32mo, 48mo, 72mo, etc. ..		24, etc. or 48, etc.

## DISCOUNTS

1½ per cent is	s. d.	20 per cent is	s. d.
2½ " "	0 3	22½ " "	4 0
5 " "	0 6	25 " "	4 6
7½ " "	1 0	30 " "	5 0
10 " "	1 6	33½ " "	6 0
12½ " "	2 0	35 " "	6 8
15 " "	2 6	40 " "	7 0
17½ " "	3 0	50 " "	8 0
	3 6		10 0

in the Pound      in the Pound

## DECIMAL PARTS AND THEIR EQUIVALENT VULGAR FRACTIONS

.875 = $\frac{7}{8}$ = seven-eighths	.375 = $\frac{3}{8}$ = three-eighths.
.75 = $\frac{3}{4}$ = three-quarters.	.25 = $\frac{1}{4}$ = one-quarter.
.625 = $\frac{5}{8}$ = five-eighths.	.125 = $\frac{1}{8}$ = one-eighth.
.5 = $\frac{1}{2}$ = one-half.	.1 = $\frac{1}{10}$ = one-tenth.

## TIME WHEN MONEY DOUBLES ITSELF AT INTEREST

Per Cent	Simple Interest	Compound Interest
25	4 years	3 <sup>4</sup> / <sub>10</sub> years
22½	4 <sup>4</sup> / <sub>9</sub> " "	3 <sup>5</sup> / <sub>12</sub> " "
20	5 " "	3 <sup>10</sup> / <sub>12</sub> " "
17½	5 <sup>5</sup> / <sub>7</sub> " "	4 <sup>1</sup> / <sub>3</sub> " "
15	6 <sup>2</sup> / <sub>3</sub> " "	5 " "
12½	8 " "	5 <sup>5</sup> / <sub>6</sub> " "
10	10 " "	7 <sup>1</sup> / <sub>2</sub> " "
9	11 <sup>4</sup> / <sub>9</sub> " "	8 " "
8	12 <sup>1</sup> / <sub>2</sub> " "	9 " "
7	14 <sup>2</sup> / <sub>7</sub> " "	10 <sup>1</sup> / <sub>3</sub> " "
6	16 <sup>2</sup> / <sub>3</sub> " "	11 <sup>5</sup> / <sub>6</sub> " "
5	20 " "	14 <sup>1</sup> / <sub>5</sub> " "
4	25 " "	17 <sup>3</sup> / <sub>4</sub> " "
3	33 <sup>1</sup> / <sub>3</sub> " "	23 <sup>1</sup> / <sub>3</sub> " "
2½	40 " "	28 <sup>1</sup> / <sub>15</sub> " "



## ABBREVIATIONS IN COMMON USE.

- A.D.**—(L. anno Domini) in the year of our Lord.  
**Ad lib.**—(L. ad libitum) at pleasure.  
**A. Et.**—(L. aetatis) of age (so and so).  
**A.M.**—(L. Ante meridiem) before noon.  
**Anon.**—Anonymous.  
**A.R.A.**—Associate Royal Academy.  
**A.S.C.**—Army Service Corps.  
**B.A.**—(L. Baccalaureus Artium) Bachelor of Arts.  
**Bart. or Bt.**—Baronet.  
**B.C.**—Before Christ.  
**B. Comm.**—Bachelor of Commerce.  
**B.C.L.**—Bachelor of Civil Law.  
**B.D.**—Bachelor of Divinity.  
**B.S. or Ch. B.**—(L. Chirurgiae Baccalaureus) Bachelor of Surgery.  
**B.Sc.**—Bachelor of Science.  
**C.**—(centum) a hundred; Cent.  
**C.B.**—Companion of the Bath.  
**C.E.**—Civil Engineer; Church of England.  
**Cf.**—(L. confer) compare.  
**C.M.G.**—Companion of the Order of St. Michael and St. George.  
**C.O.D.**—Cash on Delivery.  
**Col.**—Colonel; Colossians.  
**Com.**—Commissioner; Commodore; Committee; Commerce.  
**C/o.**—Care of.  
**Con.**—Contra.  
**Cr.**—Credit, creditor.  
**C.S.I.**—Companion of the Star of India.  
**C.T.F.**—Cost of Transit and Freight.  
**C.T.F. & E.**—Cost of Transit, Freight and Exchange.  
**D.**—500; d. (denarii) pence.  
**D.C.L.**—Doctor of Civil Law.  
**D.C.M.**—Distinguished Conduct Medal.  
**D.D.**—Doctor of Divinity.  
**D.G.**—By the Grace of God.  
**Do.**—Ditto; the same.  
**D. Litt.**—Doctor of Literature.  
**Dr.**—Doctor, debtor.  
**D. Sc.**—Doctor of Science.  
**D.S.O.**—Distinguished Service Order.  
**D.V.**—(Deo volente) God willing.  
**E. & O.E.**—Errors and omissions excepted.  
**E.G.**—For example.  
**Etc.**—(L. et cetera) and so forth.  
**F.D.**—(L. Fidei Defensor) Defender of the Faith.  
**F.O.B.**—Free on Board.  
**F.O.R.**—Free on Rail.  
**F.R.C.P.**—Fellow of Royal College of Physicians.  
**F.R.C.S.**—Fellow of Royal College of Surgeons.  
**F.R.S.**—Fellow of Royal Society.

## Abbreviations in Common Use (Continued)

- G.C.B.**—Kt. Grand Cross of the Bath.  
**G.R.**—(L. Georgius Rex) King George.  
**H.M.S.**—His Majesty's Ship, or service.  
**ib. or Ibid.**—(L. Ibidem) in the same place.  
**I.E.**—(L. id est) that is.  
**Incog.**—(L. incognito) unknown.  
**J.P.**—Justice of the Peace.  
**K.B.**—Knight of the Bath.  
**K.C.**—King's Counsel.  
**K.C.B.**—Knight Commander of the Bath.  
**K.C.M.G.**—Knight Commander of St. Michael and St. George.  
**K.C.S.I.**—Knight Commander of Star of India.  
**K.G.**—Knight of the Garter.  
**Lb.**—(L. Libra) pound in weight.  
**L.D.S.**—Licentiate of Dental Surgery.  
**LL.B.**—(L. Legum Baccalaureus) Bachelor of Laws.  
**LL.D.**—(L. Legum Doctor) Doctor of Laws.  
**L.R.C.P.**—Licentiate of Royal College of Physicians.  
**L.R.C.S.**—Licentiate of Royal College of Surgeons.  
**L. s. d.**—(L. libra, solidi, denarii).  
**M.**—(L. mille) thousand, also (L. merides) noon.  
**M.A.**—(L. Magister Artium) Master of Arts.  
**M.B.**—(L. Medicinæ Baccalaureus) Bachelor of Medicine.  
**M.B.E.**—Member of Order of the British Empire.  
**M.C.**—Master of Ceremonies; Military Cross.  
**M.D.**—(L. Medicinæ Doctor) Doctor of Medicine.  
**Messrs.**—Messieurs, Gentlemen, Sirs.  
**M.P.**—Member of Parliament.  
**M.P.S.**—Member of Pharmaceutical (or Philological) Society.  
**Ms.**—Manuscript; Mss. Manuscripts.  
**M.S.**—Master of Surgery.  
**M. Sc.**—Master of Science.  
**Mus. Bac.**—Bachelor of Music.  
**Mus. Doc.**—Doctor of Music.  
**N.B.**—(L. nota bene) note well; take note.  
**N.C.O.**—Non-commissioned officer.  
**Nem. Com.**—(L. nemine contradicente) no-one dissenting.  
**Non. Seq.**—(L. non sequitur) it does not follow.  
**N.P.**—Notary Public.  
**Ch.**—(L. obiit) died.  
**O.B.E.**—Order of British Empire.  
**O.H.M.S.**—On His Majesty's Service.  
**Oxon.**—(L. Oxonia) Oxford; also (L. Oxoniensis) of Oxford.  
**Oz.**—Ounce or Ounces.  
**P.C.**—Privy Council or Councillor.  
**p.c.**—per cent.



### Abbreviations in Common Use (Continued)

<b>Per Cent.</b> —(L. per centum) by the hundred.	<b>R.S.V.P.</b> —(F. répondez s'il vous plait) reply if you please.
<b>Ph.D.</b> —Doctor of Philosophy	<b>S.O.S.</b> —Save our Souls (Wireless Signal sent out by ships in last extremity of distress.)
<b>P.M.</b> —(L. post meridiem) after noon.	<b>S.P.C.A.</b> —Society for Prevention of Cruelty to Animals.
<b>Pro tem.</b> —(L. pro tempore) for the time being.	<b>Ult.</b> —(L. ultimo) last, of the month.
<b>Prox.</b> —(L. proximo) next month.	<b>U.S.A.</b> —United States of America.
<b>P.S.</b> —(L. post scriptum) written after.	<b>V.</b> —(L. versus) against.
<b>Q.E.D.</b> —(L. quod erat demonstrandum) which was to be demonstrated.	<b>V.C.</b> —Victoria Cross.
<b>R.A.</b> —Royal Academy; Royal Artillery.	<b>viz.</b> —(L. videlicet) namely.
<b>R.A.F.</b> —Royal Air Force.	<b>Xm. or Xmas.</b> —Christmas.
<b>R.N.</b> —Royal Navy.	<b>Y.M.C.A.</b> —Young Men's Christian Association.

### TIME AND WATCHES ON SHIPS

On board ship the day is divided into Seven Watches, and the crew into two divisions—the Starboard (on the steersman's right) and the Port (on the steersman's left.) These divisions divide the watching and working of the ship into convenient and equal portions, and enable the crew to watch and work at alternate times. During the day there are Seven Watches :

Afternoon Watch from Noon to 4 P.M.	
First Dog            "            4 to 6    "	
Second Dog         "            6 to 8    "	
First                 "            8 to 12   "	
Middle              "           12 to 4 A.M.	
Morning             "           4 to 8    "	
Forenoon            "           8 to 12   "	

The Time is kept by means of bells, which are struck at frequent intervals, and in a way understood by the crew.

### DEPTH OF OCEANS

The greatest known depth of the sea is the South Atlantic Ocean, midway between the island of Tristan d'Acunha and the mouth of the Rio de la Plata. The bottom was there reached at a depth of 46,236 feet, or 8 $\frac{3}{4}$  miles. In the North Atlantic Ocean, south of Newfoundland, soundings have been made to a depth of 4,580 fathoms, or 27,480 feet, while depths equalling 34,000 feet, or 6 $\frac{1}{2}$  miles, are reported south of Bermuda Island. The average depth of the Pacific Ocean, between Japan and California is a little over 2,000 fathoms. The average depth of all the oceans is from 2,000 to 3,000 fathoms.

### LENGTH OF THE PRINCIPAL RIVERS OF THE WORLD

Name.	Length in Miles	Name.	Length in Miles
<b>EUROPE</b>		<b>ASIA</b>	
Volga .....	2,300	Yenisei .....	2,950
Danube .....	1,720	Amur .....	2,920
Don .....	1,120	Yangtse-kiang .....	2,850
Dneiper .....	1,120	Obi .....	2,700
Pechora .....	1,090	Hoang-ho .....	2,580
Dwina .....	1,010	Lena .....	2,490
Rhine .....	805	Indus .....	1,975
Elbe .....	720	Ganges .....	1,680
Vistula .....	650	Euphrates .....	1,620
Loire .....	620	Amu Daria .....	1,370
Tagus .....	550	<b>AMERICA</b>	
Oder .....	550	Mississippi-Missouri ..	4,060
Rhone .....	503	Amazon .....	3,550
Po .....	405	St. Lawrence .....	2,370
Shannon .....	254	La Plata .....	2,230
Thames .....	215	Mackenzie .....	2,200
<b>AFRICA</b>		Rio Grande .....	1,740
Nile .....	3,680	Saskatchewan-Nelson	1,490
Congo .....	2,880	Orinoco .....	1,380
Niger .....	2,585	Columbia .....	1,240
Zambesi .....	1,650	Colorado .....	1,240
Orange .....	1,155	<b>AUSTRALIA</b>	
Limpopo .....	995	Murray .....	1,550
Senegal .....	890		



### PRINCIPAL LAKES AND MOUNTAINS OF THE WORLD

Lakes		Mountains	
	Area in Sq. Miles		Height of Highest Peak in Feet
<b>EUROPE</b>			
Ladoga .....	6,960	Alps (Mt. Blanc) ..	15,780
Onega .....	3,290	Sierra Nevada ....	11,420
Wener .....	2,410	Pyrenees .....	11,170
Peipus .....	1,355	Balkans .....	10,010
Wetter .....	760	Appenines .....	9,580
Geneva .....	224	Carpathians .....	8,740
Constance .....	208	Scandinavian Alps .	8,400
Neagh .....	152	Auvergne .....	6,190
Lomond .....	27	Urals .....	5,430
Windermere....	6	Grampians (B. Nevis)	4,406
<b>ASIA</b>			
Caspian Sea ...	165,520	Himalayas (Everest)	29,002
Aral .....	26,165	Pamir Plateau.....	25,000
Baikal.....	13,490	Tien Shan .....	24,000
Balkash .....	7,960	Kwenlun .....	22,380
Issik-kul .....	2,000	Hindu Kush .....	18,870
Urmia .....	1,480	Elburz .....	18,500
Kuku-nor .....	1,460	Mts. of Armenia ...	16,920
Van .....	1,420	Taurus .....	12,500
Dead Sea .....	353	Altai .....	11,000
<b>AFRICA</b>			
Victoria .....	26,350	Kilimanjaro .....	19,700
Tanganyika ...	13,550	Kenya .....	17,200
Tsad .....	10,430	Ruwenzori .....	17,000
Nyasa .....	10,230	Abyssinian Highlands	15,200
Rudolf .....	3,960	Atlas .....	14,150
Albert .....	1,740	Cameroon Peak....	13,000
Edward .....	1,505	Drakensberg.....	11,000

### PRINCIPAL LAKES AND MOUNTAINS OF THE WORLD— continued.

Lakes		Mountains	
	Area in Sq. Feet		Height of Highest Peak in Feet
<b>AMERICA</b>			
Superior .....	31,200	Andes (Aconcagua).	23,081
Huron .....	23,800	„ (Sorata).....	21,470
Michigan .....	22,450	„ (Chimborazo)	20,610
Great Bear.....	11,200	Rocky Mts.	
Great Slave ....	10,000	(Mt. McKinley).	20,464
Erie.....	9,950	Rocky Mts. (Logan)	19,515
Winnipeg .....	9,270	„ (St. Elias)	18,020
Ontario.....	7,240	Mexican Mts.....	17,880
Nicaragua .....	4,440	Sa. Nevada.....	16,700
Titicaca .....	3,220	Cascade Mts. ....	14,440
Great Salt Lake	2,360	Rocky Mts. (Long Pk.)	14,270
<b>AUSTRALIA, etc.</b>			
Eyre (Salt).....	3,670	Alleghanies .....	6,707
Gairdner (Salt) .	3,100	<b>AUSTRALASIA, etc.</b>	
Torrens (Salt) ..	2,320	Hawaii Mts.....	13,953
Taupo (N. Z.)...	238	Mt. Victoria(N. G.) .	13,120
Te Anau (New Zealand).....	132	Mt. Erebus (Antarc.)	12,760
		New Zealand Alps .	12,348
		Australian Alps....	7,340

### AUSTRALIA—AREA AND POPULATION OF STATES AND TERRITORIES

State or Territory	Area	Population
	Sq. Miles	
New South Wales .....	309,432	2,517,758
Victoria .....	87,884	1,801,294
Queensland .....	670,500	963,711
South Australia .....	380,070	584,968
Western Australia .....	975,920	421,609
Tasmania .....	26,215	223,390
Northern Territory .....	523,620	4,458
Federal Capital Territory ....	940	8,732
	<b>2,974,581</b>	<b>6,525,920</b>



## THE RAILWAYS OF THE WORLD

Country	Mileage	Country	Mileage
United States . . . . .	250,970	China . . . . .	7,558
Russia (Eur.&Asia) . . . . .	47,022	Rumania . . . . .	7,457
Canada . . . . .	40,352	Hungary . . . . .	5,908
India . . . . .	39,711	Yugoslavia . . . . .	5,699
Germany . . . . .	34,811	Chile . . . . .	5,642
France . . . . .	33,197	Austria . . . . .	4,373
Australia . . . . .	24,624	Switzerland . . . . .	3,739
Argentina . . . . .	23,482	Ireland . . . . .	3,260
Great Britain . . . . .	20,396	Denmark . . . . .	3,230
Brazil . . . . .	19,042	New Zealand . . . . .	3,157
Mexico . . . . .	16,445	Belgium . . . . .	3,151
Japan . . . . .	13,110	Cuba . . . . .	3,020
Union of S. Africa . . . . .	12,897	Finland . . . . .	2,821
Italy . . . . .	12,840	Holland . . . . .	2,405
Poland . . . . .	11,974	Egypt . . . . .	2,302
Sweden . . . . .	9,968	Norway . . . . .	2,248
Spain . . . . .	9,676	Portugal . . . . .	2,124
Czechoslovakia . . . . .	8,408	Peru . . . . .	2,081

## THE WORLD'S GREATEST BRIDGES.

Name of Bridge	Where Situate	Length in feet
Tay . . . . .	Scotland . . . . .	10,780
Ohio . . . . .	United States . . . . .	10,560
Victoria . . . . .	Montreal . . . . .	9,144
Forth . . . . .	Scotland . . . . .	8,296
Missouri . . . . .	United States . . . . .	7,632
Queensborough . . . . .	New York . . . . .	7,500
Williamsburgh . . . . .	New York . . . . .	7,398
Manhattan . . . . .	New York . . . . .	6,840
Rio Salado . . . . .	Argentina . . . . .	6,700
Susquehanna . . . . .	United States . . . . .	6,315
Brooklyn . . . . .	New York . . . . .	5,989
Hardinge . . . . .	India . . . . .	5,380
Moerdijk . . . . .	Holland . . . . .	4,698
Sydney Harbour . . . . .	Australia . . . . .	3,770
Cernavoda . . . . .	Danube . . . . .	2,350
Ambassador (Detroit) . . . . .	Canada—United States . . . . .	1,850
Grumlin Viaduct . . . . .	Monmouth . . . . .	1,800
Boyne Viaduct . . . . .	Ireland . . . . .	1,760
Menai Suspension . . . . .	Wales . . . . .	1,710
Tweed . . . . .	Berwick . . . . .	1,410
High Level . . . . .	Newcastle . . . . .	1,380
Tower . . . . .	London . . . . .	800
Clifton Suspension . . . . .	Clifton (Bristol) . . . . .	702
Victoria Falls* . . . . .	Rhodesia . . . . .	650

\*400 feet above water-level ; the highest in the World.

## THE HUNDRED LARGEST CITIES OF THE WORLD

(Population in thousands according to latest censuses)

London (G'ter) 8,203	Milan . . . . . 973	Breslau . . . . . 600
„ (C'ty) 4,397	Mexico City . 968	Turin . . . . . 598
New York . . . . 6,930	Rome . . . . . 935	Kiung-chow . . 590
Berlin . . . . . 4,024	Nagoya . . . . 907	Copenhagen . . 587
Chicago . . . . . 3,375	Cleveland . . . 900	Lisbon . . . . . 587
Paris . . . . . 2,871	Bucharest . . . 890	Rotterdam . . . 584
Osaka . . . . . 2,454	Sao Paulo . . . 880	Havana . . . . . 581
Moscow . . . . . 2,412	Liverpool . . . 856	Milwaukee . . . 578
Buenos Aires . . 2,116	Brussels . . . . 833	Victoria(H.-K) 577
Tokyo . . . . . 2,071	Madrid . . . . . 825	Buffalo . . . . . 573
Shanghai . . . . 1,979	St. Louis . . . . 822	Alexandria . . . 573
Philidelphia . . . 1,951	Baltimore . . . . 805	Lyons . . . . . 571
Vienna . . . . . 1,866	Kobe . . . . . 788	Bangkok . . . . 548
Leningrad . . . . 1,614	Boston . . . . . 781	Frankfurt . . . . 540
Hang-Kow . . . . 1,584	Barcelona . . . . 775	Santiago . . . . . 538
Detroit . . . . . 1,569	Manchester . . . 766	Madras . . . . . 527
Rio de Janeiro 1,469	Kyoto . . . . . 765	Hang-chow . . . 526
Tientsin . . . . . 1,389	Amsterdam . . . 748	Dortmund . . . . 526
Peking Peiping 1,298	Cologne . . . . . 700	Nanking . . . . . 523
Sydney . . . . . 1,239	Toronto . . . . . 691	Kiev . . . . . 514
Los Angeles . . . 1,238	Istanbul . . . . 691	Sheffield . . . . . 512
Bombay . . . . . 1,176	Munich . . . . . 685	Stockholm . . . . 509
Calcutta . . . . . 1,132	Leipzig . . . . . 679	Washington . . . 487
Warsaw . . . . . 1,109	Wen-chow . . . . 678	Leeds . . . . . 483
Montreal . . . . . 1,098	Prague . . . . . 677	Montevideo . . . 469
Glasgow . . . . . 1,088	Marseilles . . . . 652	Dusseldorf . . . . 465
Hamburg . . . . . 1,079	Chung-king . . . 635	Minneapolis . . . 464
Cairo . . . . . 1,065	San Francisco 634	New Orleans . . . 459
Birmingham . . . 1,022	Essen . . . . . 630	Palermo . . . . . 456
Melbourne . . . . 1,018	Genoa . . . . . 626	Athens . . . . . 453
Budapest . . . . . 1,005	Yokohama . . . . 620	Baku . . . . . 453
Siang-tan . . . . . 1,000	Dresden . . . . . 619	Cincinnati . . . . 451
Sian-fu . . . . . 1,000	Chang-sha . . . . 607	Ichang . . . . . 450
Naples . . . . . 980	Lodz . . . . . 607	Newark (N.J.) 442



## ELECTRICAL UNITS

## PRACTICAL UNITS

**Current.**—Ampere. 1 micro-ampere =  $\frac{\text{ampere}}{1,000,000}$ . 1 milli-ampere =  $\frac{\text{ampere}}{1,000}$ .

**Resistance.**—Ohm. 1 microhm = one-millionth of an ohm. 1 megohm = one million ohms.  $\infty$

**Electromotive Force.**—Volt. 1 microvolt = one-millionth of a volt.

**Power or Activity.**—Watt. = one-746th part of a horse-power. Kilowatt = one thousand watts =  $1\frac{1}{2}$  horse-power (about).

**Energy or Work.**—Joule = one watt-second = 0.7372 foot pounds.

**Board of Trade Unit** = 1 kilowatt-hour = 3.6 million Joules =  $1\frac{1}{2}$  horse-power hours.

**Capacity.**—Farad. 1 microfarad = one-millionth of a farad.

**Quantity.**—Coulomb = 1 ampere flowing for 1 second of time.

**Self and Mutual Inductance.**—Henry, Quadrant, or Sec-ohm; these are all names for the same unit. The Henry is that most usually employed.

## COMMONLY EMPLOYED ELECTRICAL ABBREVIATIONS AND SYMBOLS

**B.T.U. or B.O.T. Unit** = Board of Trade Unit.

$\infty$  = megohm.  $w$  = ohm, thus  $10w$  = ten ohms.

$\alpha$  or **I** = Ampere

**D.P.** = double pole. **S.P.** = single pole. **H.R.** = high resistance. **H.C.** = high conductivity. **D.C.C.** = double cotton covered (of wires). **G.P.** = Gutta-percha. **I.R.** = india-rubber; sometimes also insulation resistance. **W.I.** = wrought iron. **C.I.** = cast iron. **L.S.W.** = London standard wire gauge. **B.W.G.** = Birmingham wire gauge. **S.W.G.** = standard wire gauge. When used in describing cables, a fraction such as  $11/16$  means 11 of number 16 wire, the 16 referring to some particular wire gauge.

**E.M.F.** = electricity moving force, or electro-motive force.

**P.D.** = potential difference, or pressure difference.

**Virt. Amps.** = virtual amperes, or effective amperes, and refers to an alternating current measured in terms of the heat it produces in a given resistance.

**Virt. Volts** = virtual volts, or effective volts, and refers to an alternating voltage measured in terms of the heat it produces in a given resistance.

$\sqrt{\text{M.S. or R.M.S.}}$  means the square root of the mean square, and is used concerning alternating currents and voltages; it is precisely equivalent to the expression "virtual or effective amperes or volts."

$\omega$  = frequency, and means the number of alterations an alternating current or voltage undergoes per second.

## GREEK ALPHABET

Capitals.	Small Letters.	English Equivalents in Sound.	Name in English.	Capitals.	Small Letters.	English Equivalents in Sound.	Name in English.
A	$\alpha$	a	Alpha	N	$\nu$	n	Nu
B	$\beta$	b	Bēta	Ξ	$\xi$	x	Xi
Γ	$\gamma$	g	Gamma	Ο	$\omicron$	o short	Omicron
Δ	$\delta$	d	Delta	Π	$\pi$	p	Pi
E	$\epsilon$	e short	Epsilon	Ρ	$\rho$	r	Rho
Z	$\zeta$	z	Zeta	Σ	$\sigma \varsigma$	s	Sigma
H	$\eta$	e long	Eta	T	$\tau$	t	Tau
Θ	$\theta$	th	Theta	Υ	$\upsilon$	u	Upsilon
I	$\iota$	i	Iota	Φ	$\phi$	ph	Phi
K	$\kappa$	k	Kappa	Χ	$\chi$	ch	Chi (ki)
Λ	$\lambda$	l	Lambda	Ψ	$\psi$	ps	Psi
M	$\mu$	m	Mu	Ω	$\omega$	o long	Omega



## SAVINGS BANKS IN AUSTRALIA

	Amount on deposit
New South Wales .....	£71,082,991
Victoria .....	65,863,410
Queensland .....	22,986,953
South Australia .....	21,662,768
Western Australia .....	9,995,141
Tasmania .....	5,705,767
Federal Capital Territory .....	250,375
Northern Territory .....	4,400
<b>Australia .....</b>	<b>£197,588,805</b>

## DISTANCE TABLE BY WATER

		miles.
Freemantle	to Adelaide .....	1,353
"	to Singapore .....	2,412
"	to Colombo .....	3,120
Albany	to Adelaide .....	1,036
Adelaide	to Melbourne .....	499
"	to Capetown .....	4,429
Melbourne	to Sydney .....	576
"	to Hobart .....	443
"	to Launceston .....	263
"	to Brisbane .....	1,050
"	to Wellington .....	1,571
"	to Bluff .....	1,184
"	to Brisbane .....	474
Sydney	to Hobart .....	628
"	to Wellington .....	1,230
"	to Auckland .....	1,279
"	to London, via Vancouver .....	12,925
"	to London, via Suez direct .....	11,603
"	to London, via Panama .....	12,421
"	to London, via Cape of Good Hope .....	13,379

## THE SEVEN WONDERS OF THE ANCIENT WORLD

1. Olympian Zeus, a famous statue by Phidias.
2. Diana's Temple at Ephesus was supported by 127 columns, each weighing 150 tons.
3. The Great Pyramid, 12 miles from Cairo. Supposed date of erection is 2200 B.C. covering an area when first built of 13 acres. It is 543 feet high and 693 feet on the sides. Its base covers 11 acres. Many of the stones are 30 feet long, 4 feet broad, and 3 feet thick. Its central chamber is a room hewn out of the solid stone, 46 feet long, 16 feet wide, and 23 feet high. It contains a sarcophagus, probably of the builder.
4. The Colossus of Rhodes, a brass statue 105 feet in height, spanned the harbour with its feet, beneath which the tallest ships pass. It was made by Chares, who, aided by an army of workmen, consumed 12 years in its construction. It remained in position in the harbour of Rhodes for 66 years and was thrown down by an earthquake B.C. 224. It lay on the ground 894 years, and was sold to a Jew for old metal. He carried away 900 cart loads or about 720,000 pounds of bronze. There were over 100 colossal statues in the city of Rhodes, besides the great bronze image that bestrode the harbour.
5. The Mausoleum of Halicarnassus, a magnificent tomb built 354 years B.C. by Mausoleus' Queen Artemisia.
6. The Hanging Gardens of Babylon, were terraces on columns. The gardens were 400 feet square and over 400 feet high. The ascent from terrace to terrace was by flights of marble steps, and on the highest was a large reservoir. They were erected for the amusement of a Babylonian Queen who had come from a mountainous country. The Tower of Babel, at Babylon, was composed of eight square towers, one upon the other, the pile being 660 feet high. Babylon was a square, 15 miles on each side, the walls 87 feet thick and 370 feet high.
7. The Pharos at Alexandria, a light-house located on a small island in Lower Egypt, built 300 years B.C.



## THE WORLD'S GREATEST CATHEDRALS

	Length ft.	Breadth ft.	Height ft.
St. Peter's, Rome ..	613	450	438
St. Paul's, London .	500	248	404
Duomo, Florence... .	555	240	375
Notre Dame, Paris .	416	153	298
Cologne .....	444	283	—
Toledo .....	395	178	—
Rheims .....	480	163	117
Rouen .....	459	146	465
Chartres .....	430	150	373
Antwerp .....	384	171	492
Strassbourg .....	525	195	465
Milan .....	477	186	360
Canterbury .....	530	154	235
York .....	524	261	—
Winchester .....	554	208	—
Durham .....	411	170	214
Ely .....	617	178	—
Salisbury .....	473	229	279

## ORIGIN OF NAMES OF FABRICS

- Muslin is named from Mosul, in Asia.  
 Taffeta and tabby from a street in Bagdad.  
 Drugget is derived from a city in Ireland, Drogheda.  
 Cambric from Cambrai. Gauze from Gaza.  
 Baize from Bajac, Dimity from Damietta.  
 Damask is from the city of Damascus.  
 Satins from Zaytown in China.  
 Velvet is from the Italian, vellute, woolly (Latin vellet—a hide or pelt).  
 Serge derives its name from Xerga, a Spanish name for a peculiar woollen blanket.  
 Shawl is the Sanscrit sala (floor), for shawls were first used as carpets and tapestry.  
 Bandanna is from an Indian word to bind or tie, because it is tied in knots before dyeing.  
 Alpaca from an animal in Peru, of the Llama species, from whose wool the fabric is woven.  
 Diaper is not from D'Ypres, as it is sometimes stated, but from the Greek diaspros, figured.

ERRATA

Page 23 at foot— miles  
 Equatorial Diameter . . . 7,925.604  
 Polar Diameter . . . . . 7,899.114  
 Circumference on Equator 24,899.022

Page 57—Area of lakes is in square miles not feet.

Page 62—Savings Bank Deposits are as at 31st August, 1932. Northern Territory should be £41,400.