

### APPENDIX 7

Table for length conversion

Unit	mm	cm	m	km	in	ft	yd	mi
1 millimeter	1	0.1	0.001	$10^{-6}$	0.0397	0.00328	0.00109	$6.21 \times 10^{-7}$
1 centimeter	10	1	0.01	0.0001	0.3937	0.0328	0.0109	$6.21 \times 10^{-6}$
1 meter	1000	100	1	0.001	39.37	3.281	1.094	$6.21 \times 10^{-4}$
1 kilometer	$10^6$	$10^5$	1000	1	39,370	3281	1093.6	0.621
1 inch	25.4	2.54	0.0254	$2.54 \times 10^{-5}$	1	0.0833	0.0278	$1.58 \times 10^{-5}$
1 foot	304.8	30.48	0.3048	$3.05 \times 10^{-4}$	12	1	0.333	$1.89 \times 10^{-4}$
1 yard	914.4	91.44	0.9144	$9.14 \times 10^{-4}$	36	3	1	$5.68 \times 10^{-4}$
1 mile	$1.61 \times 10^6$	$1.01 \times 10^5$	$1.61 \times 10^3$	1.6093	63,360	5280	1760	1

### APPENDIX 8

Table for area conversion

Unit	cm <sup>2</sup>	m <sup>2</sup>	km <sup>2</sup>	ha	in <sup>2</sup>	ft <sup>2</sup>	yd <sup>2</sup>	mi <sup>2</sup>	ac
1 sq. centimeter	1	0.0001	$10^{-10}$	$10^{-8}$	0.155	$1.08 \times 10^{-3}$	$1.2 \times 10^{-4}$	$3.86 \times 10^{-11}$	$2.47 \times 10^{-8}$
1 sq. meter	$10^4$	1	$10^{-6}$	$10^{-4}$	1550	10.76	1.196	$3.86 \times 10^{-7}$	$2.47 \times 10^{-4}$
1 sq. kilometer	$10^{10}$	$10^6$	1	100	$1.55 \times 10^9$	$1.076 \times 10^7$	$1.196 \times 10^6$	0.3861	247.1
1 hectare	$10^8$	$10^4$	0.01	1	$1.55 \times 10^7$	$1.076 \times 10^5$	$1.196 \times 10^4$	$3.861 \times 10^{-3}$	2.471
1 sq. inch	6.452	$6.45 \times 10^{-4}$	$6.45 \times 10^{10}$	$6.45 \times 10^{-8}$	1	$6.94 \times 10^{-3}$	$7.7 \times 10^{-4}$	$2.49 \times 10^{-10}$	$1.574 \times 10^{-7}$
1 sq. foot	929	0.0929	$9.29 \times 10^{-8}$	$9.29 \times 10^{-6}$	144	1	0.111	$3.587 \times 10^{-8}$	$2.3 \times 10^{-5}$
1 sq. yard	8361	0.8361	$8.36 \times 10^{-7}$	$8.36 \times 10^{-5}$	1296	9	1	$3.23 \times 10^{-7}$	$2.07 \times 10^{-4}$
1 sq. mile	$2.59 \times 10^{10}$	$2.59 \times 10^6$	2.59	259	$4.01 \times 10^9$	$2.79 \times 10^7$	$3.098 \times 10^6$	1	640
1 acre	$4.04 \times 10^7$	4047	$4.047 \times 10^{-3}$	0.4047	$6.27 \times 10^6$	43,560	4840	$1.562 \times 10^{-3}$	1

### APPENDIX 9

Table for volume conversion

Unit	mL	liters	m <sup>3</sup>	in <sup>3</sup>	ft <sup>3</sup>	gal	ac-ft	million gal
1 milliliter	1	0.001	$10^{-6}$	0.06102	$3.53 \times 10^{-5}$	$2.64 \times 10^4$	$8.1 \times 10^{-10}$	$2.64 \times 10^{-10}$
1 liter	$10^3$	1	0.001	61.02	0.0353	0.264	$8.1 \times 10^{-7}$	$2.64 \times 10^{-7}$
1 cu. meter	$10^6$	1000	1	61,023	35.31	264.17	$8.1 \times 10^{-4}$	$2.64 \times 10^{-4}$
1 cu. inch	16.39	$1.64 \times 10^{-2}$	$1.64 \times 10^{-5}$	1	$5.79 \times 10^{-4}$	$4.33 \times 10^{-3}$	$1.218 \times 10^{-8}$	$4.329 \times 10^{-9}$
1 cu. foot	28,317	28.317	0.02832	1728	1	7.48	$2.296 \times 10^{-5}$	$7.48 \times 10^6$
1 U.S. gallon	3785.4	3.785	$3.78 \times 10^{-3}$	231	0.134	1	$3.069 \times 10^{-6}$	$10^6$
1 acre-foot	$1.233 \times 10^9$	$1.233 \times 10^6$	1233.5	$75.27 \times 10^6$	43,560	$3.26 \times 10^5$	1	0.3260
1 million gallons	$3.785 \times 10^9$	$3.785 \times 10^6$	3785	$2.31 \times 10^8$	$1.338 \times 10^5$	$10^6$	3.0684	1

### APPENDIX 10

Table for time conversion

Unit	sec	min	hours	days	years
1 second	1	$1.67 \times 10^{-2}$	$2.77 \times 10^{-4}$	$1.157 \times 10^{-5}$	$3.17 \times 10^{-8}$
1 minute	60	1	$1.67 \times 10^{-2}$	$6.94 \times 10^{-4}$	$1.90 \times 10^{-6}$
1 hour	360	60	1	$4.17 \times 10^{-2}$	$1.14 \times 10^{-4}$
1 day	$8.64 \times 10^4$	1440	24	1	$2.74 \times 10^{-3}$
1 year	$3.15 \times 10^7$	$5.256 \times 10^5$	8760	365	1

## G302 Class Notes – Angular Measurement

### I. Angular Measurement

#### a. Angular Measurement (based on circle)

- i. Full Circle = 360 degrees
  1. 1 degree =  $1/360$  th of circle

#### (1) Subdivisions of Degree

- (a) 1 degree = 60 minutes
- (b) 1 minute = 60 seconds
- (c) 1 degree = 60 min x 60 sec/min = 3600 sec

#### (2) Famous Angular Measurements

- (a) Right Angle = 90 degrees
- (b) (Straight Angle) Line = 180 degrees
- (c) Circle = 360 degrees
- (d) Acute Angle < 90 degrees
- (e) Obtuse Angle: between 90-180 degrees
- (f) Complementary Angles – two angles add up to 90 degrees

#### 2. Radians – unit of angular measurement based on the length of an arc circumscribed by a circle

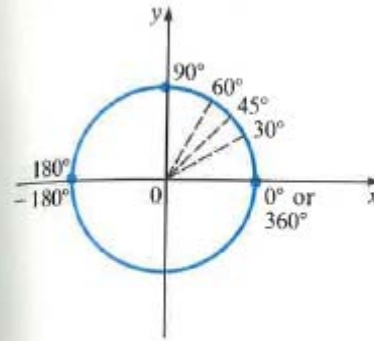
##### a. Circumference of Circle = $2\pi r$ ,

where  $\pi$  = circumference of circle / radius of circle = 3.14, and  $r$  = radius of circle

##### b. Circle = 360 degrees = $2\pi$ radians; 180 degrees = $\pi$ radians

### Degree Measure of an Angle

Let an angle be in standard position. It is said to have the measure one **degree**, written  $1^\circ$ , if the angle is obtained by rotating its terminal side  $\frac{1}{360}$  of a complete revolution in the positive (counterclockwise) direction. Thus, an angle obtained from one complete counterclockwise revolution has a measure of  $360^\circ$ ; an angle obtained from half a complete counterclockwise revolution has a measure of  $180^\circ$ ; an angle obtained from one quarter of a complete counterclockwise revolution has a measure of  $90^\circ$ , and so on. An angle obtained from half a complete revolution in the clockwise (negative) direction has a measure of  $-180^\circ$ . If the terminal side is not rotated so that the initial and terminal sides coincide, then the angle has measure zero degrees, written  $0^\circ$ . Some angles are depicted in Figure 2.

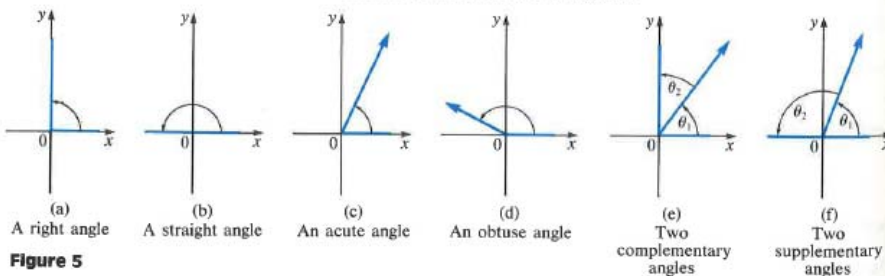


**Figure 2**

#### Some Special Angles

1. A **right angle** is an angle of  $90^\circ$ .
2. A **straight angle** is an angle of  $180^\circ$ .
3.  $\theta$  is an **acute angle** if  $0 < \theta < 90^\circ$ .
4.  $\theta$  is an **obtuse angle** if  $90^\circ < \theta < 180^\circ$ .
5. Two acute angles,  $\theta_1$  and  $\theta_2$ , are **complementary** if  $\theta_1 + \theta_2 = 90^\circ$ . We say that  $\theta_2$  is the **complement** of  $\theta_1$ , and vice versa.
6. Two positive angles,  $\theta_1$  and  $\theta_2$ , are **supplementary** if  $\theta_1 + \theta_2 = 180^\circ$ . We say that  $\theta_2$  is the **supplement** of  $\theta_1$ , and vice versa.

These ideas are illustrated in Figure 5.



**Figure 5**