

## Presentation #2

# Basic Dimensioning Skills

*Objective 006.02*

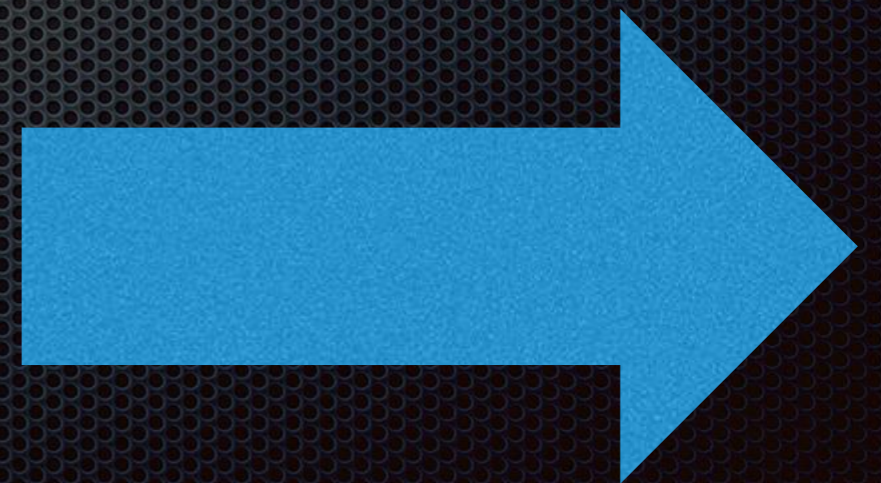
*Explain the procedure for dimensioning mechanical drawings.*

### FRACTIONS – DECIMALS – MILLIMETERS

	DECIMAL	MM		DECIMAL	MM
$\frac{1}{64}$	.0156	0.396	$\frac{33}{64}$	.5156	13.096
$\frac{1}{32}$	.0312	0.793	$\frac{35}{64}$	.5312	13.493
$\frac{3}{64}$	.0468	1.190	$\frac{37}{64}$	.5468	13.890
$\frac{1}{16}$	.0625	1.587	$\frac{39}{64}$	.5625	14.287
$\frac{5}{64}$	.0781	1.984	$\frac{41}{64}$	.5781	14.684
$\frac{3}{32}$	.0937	2.381	$\frac{43}{64}$	.5937	15.081
$\frac{7}{64}$	.1093	2.778	$\frac{45}{64}$	.6093	15.478
$\frac{1}{8}$	.125	3.175	$\frac{47}{64}$	.625	15.875
$\frac{9}{64}$	.1406	3.571	$\frac{49}{64}$	.6406	16.271
$\frac{5}{32}$	.1562	3.968	$\frac{51}{64}$	.6562	16.668
$\frac{11}{64}$	.1718	4.365	$\frac{53}{64}$	.6718	17.065
$\frac{3}{16}$	.1875	4.762	$\frac{55}{64}$	.6875	17.462
$\frac{13}{64}$	.2031	5.159	$\frac{57}{64}$	.7031	17.859
$\frac{7}{32}$	.2187	5.556	$\frac{59}{64}$	.7187	18.256
$\frac{15}{64}$	.2343	5.953	$\frac{61}{64}$	.7343	18.653
$\frac{1}{4}$	.250	6.350	$\frac{63}{64}$	.750	19.050
$\frac{17}{64}$	.2656	6.746	$\frac{64}{64}$	.7656	19.446
$\frac{9}{32}$	.2812	7.143	$\frac{25}{32}$	.7812	19.843
$\frac{19}{64}$	.2968	7.540	$\frac{51}{64}$	.7968	20.240
$\frac{5}{16}$	.3125	7.937	$\frac{53}{64}$	.8125	20.637
$\frac{11}{32}$	.3281	8.334	$\frac{55}{64}$	.8281	21.034
$\frac{23}{64}$	.3437	8.731	$\frac{57}{64}$	.8437	21.431
$\frac{3}{8}$	.3593	9.128	$\frac{59}{64}$	.8593	21.828
$\frac{25}{64}$	.375	9.525	$\frac{61}{64}$	.875	22.225
$\frac{13}{32}$	.3906	9.921	$\frac{63}{64}$	.8906	22.621
$\frac{27}{64}$	.4062	10.318	$\frac{64}{64}$	.9062	23.018
$\frac{7}{16}$	.4218	10.715	$\frac{29}{32}$	.9218	23.415
$\frac{29}{64}$	.4375	11.112	$\frac{59}{64}$	.9375	23.812
$\frac{15}{32}$	.4531	11.509	$\frac{61}{64}$	.9531	24.209
$\frac{31}{64}$	.4687	11.906	$\frac{63}{64}$	.9687	24.606
$\frac{1}{2}$	.4843	12.303	$\frac{64}{64}$	.9843	25.003
	.500	12.700	1	1.000	25.400



# Procedures for using decimal and metric measurement





# Decimal inches:

- *decimals are the ANSI standard.*
- *decimals are EASIER to add, subtract, multiply and divide than fractions.*
- *preferably, decimals should be ROUNDED to two decimal places (unless more precision is required).*
- *OMIT zero before the decimal point for values of less than one.*
- *display trailing zeros equal to the drawing's PRECISION.*



# Fractional inches:

- *use where close tolerances are NOT important.*
- *the HORIZONTAL fraction bar is preferred.*
- *OMIT the inch mark when dimensions are all in inches.*

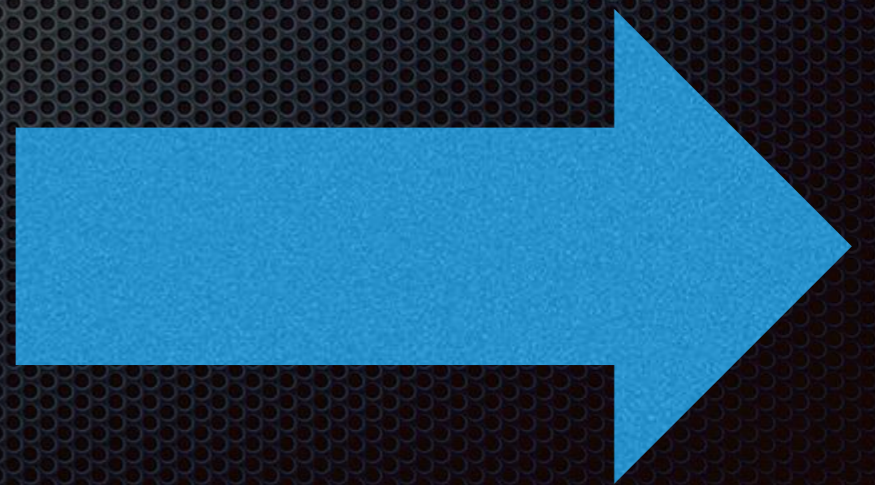


# Metric:

- *where linear measurement are LESS than 10,000 millimeters, the MILLIMETER is the standard unit of measure.*
- *the abbreviation for millimeters (mm) is usually OMITTED when ALL dimensions are in millimeters.*
- *the PERIOD is used as a decimal point in English speaking countries, others use a COMMA.*
- *if the value is less than one millimeter, a ZERO should precede the decimal point.*
- *OMIT trailing zeros.*



# General Rules of Dimension Placement





- *the number one rule of dimensioning is that of CLARITY.*
- *place dimensions where the shape is BEST shown.*
- *SHORTEST dimensions placed CLOSEST to the object.*
- *GROUP and ALIGN dimensions when possible.*
- *AVOID duplicate and/or unnecessary dimensions.*



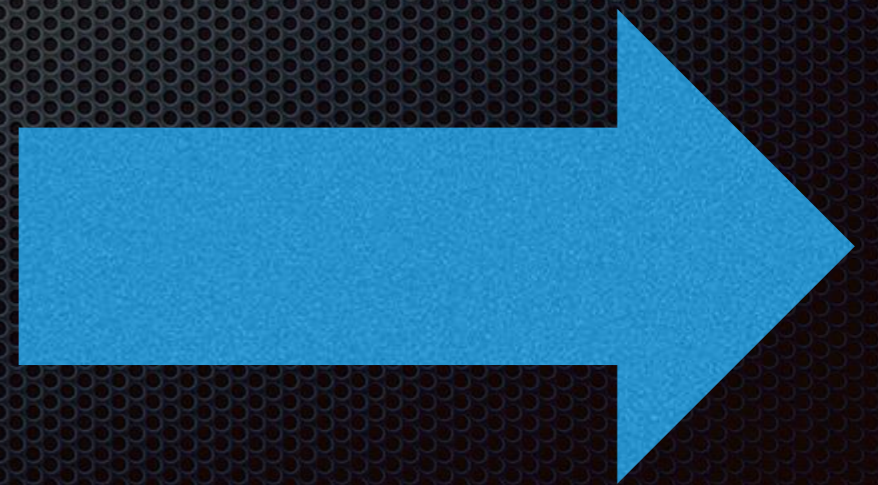
- *DO NOT place a dimension to coincide with a line of a drawing.*
- *try to AVOID placing dimensions inside a view.*
- *AVOID crowding dimensions.*
- *AVOID dimensioning to HIDDEN features.*
- *place dimensions BETWEEN the views to which they relate.*



- *LINES should be THIN and contrast noticeably with visible lines.*
- *dimensions should be included that describe both SIZE and LOCATION of features.*
- *the diameter of cylinders is dimensioned in the RECTANGULAR VIEW. The diameter of machined holes is dimensioned in the CIRCULAR VIEW.*



**Illustrate the correct placement of dimensions on the following circular features**





# Arcs:

*A. dimension by using the RADIUS.*

*B. the letter "R" should precede the arc size.*

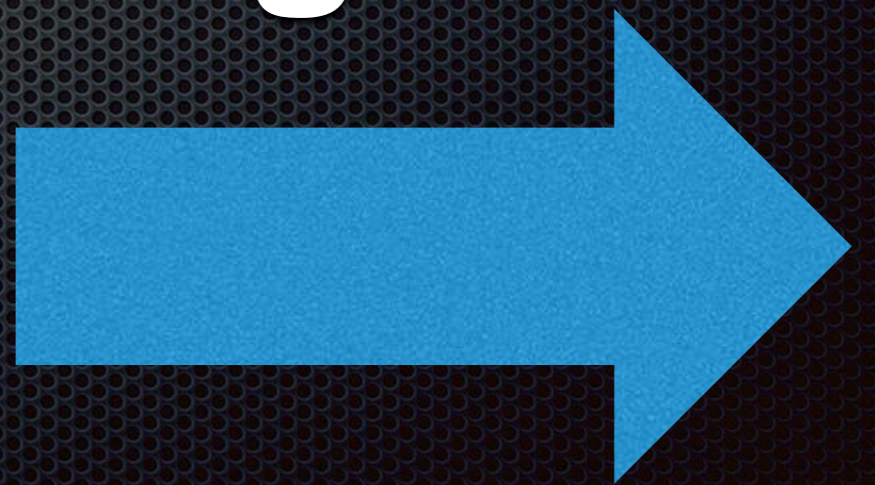


# Circles:

- A. dimension by using the DIAMETER.*
- B. the diameter symbol should precede the circle size.*
- C. use a "X" when describing the number or QUANTITY of circles.*



**Correct placement of  
dimensions on angular  
features where the angles  
are expressed in degrees**





# Point to point dimension consisting of "chains" of dimensions placed end to end

- *one dimension is OMITTED.*
- *ANSI establishes the standard or "correct" rules regarding dimension placement when creating technical drawings.*

