FORMULA SHEET FOR MECHANICAL TECHNOLOGY: WELDING AND METALWORK

1. STRESS AND STRAIN

1.1 $A_{shaft} = \frac{\pi d^2}{4}$

1.2 $A_{pipe} = \frac{\pi \left(D^2 - d^2\right)}{4}$

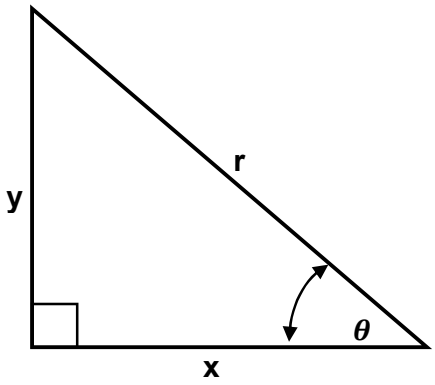
1.3 $Safety\ factor = \frac{Maximum\ stress/Break\ stress}{Safe\ working\ stress}$

1.4 $Stress = \frac{Force}{Area}$ OR $\sigma = \frac{F}{A}$

1.5 $Strain = \frac{Change\ in\ length}{Original\ length}$ OR $\varepsilon = \frac{\Delta L}{oL}$

1.6 $Young's\ modulus = \frac{Stress}{Strain}$ OR $E = \frac{\sigma}{\varepsilon}$

2. PYTHAGORAS' THEOREM AND TRIGONOMETRY



2.1 $Sin\ \theta = \frac{y}{r}$

2.2 $Cos\ \theta = \frac{x}{r}$

2.3 $Tan\ \theta = \frac{y}{x}$

2.4 $r^2 = x^2 + y^2$

3. TEMPLATES AND DEVELOPMENTS

3.1 *Mean Ø = Outside Ø – Plate thickness*

OR

Mean Ø = Inside Ø + Plate thickness

3.2 *Mean circumference = π × Mean Ø*

(where Ø = diameter)

4. SCREW THREADS

4.1 *Drill size = Outside Ø – Pitch*