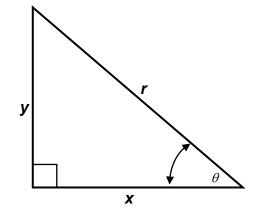# FORMULA SHEET

1. STRESS AND STRAIN

1.1   Stress $= \dfrac{\text{Force}}{\text{Area}}$ or $\sigma = \dfrac{F}{A}$

1.2   Young's modulus $= \dfrac{\text{Stress}}{\text{Strain}}$ or $E = \dfrac{\sigma}{\varepsilon}$

1.3   Strain $= \dfrac{\text{Change in length}}{\text{Original length}}$ or $\varepsilon = \dfrac{\Delta l}{ol}$

1.4 $A_{shaft} = \dfrac{\pi D^2}{4}$

1.5 $A_{pipe} = \dfrac{\pi \left(D^2 - d^2 \right)}{4}$

2. PYTHAGORAS' THEOREM AND TRIGONOMETRY

2.1 $\sin \theta = \dfrac{y}{r}$

2.2 $\cos \theta = \dfrac{x}{r}$

2.3 $\tan \theta = \dfrac{y}{x}$

2.4 $r^2 = x^2 + y^2$ **or** $a^2 = b^2 + c^2$

3. TEMPLATES AND DEVELOPMENTS

3.1   Mean ø $=$ Outside ø $-$ Plate thickness   or
       Mean ø $=$ Inside ø $+$ Plate thickness

3.2   Mean circumference $= \pi \times$ Mean ø