

## FORMULA SHEET

### 1. STRESS AND STRAIN

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

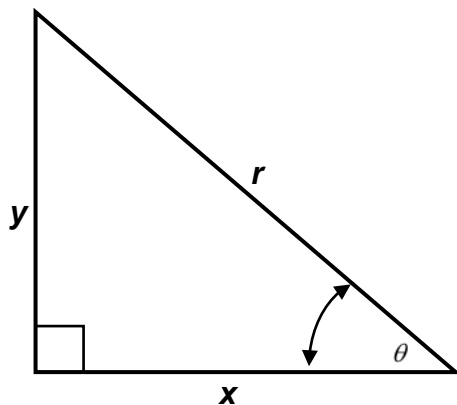
$$1.2 \quad \text{Young's modulus} = \frac{\text{Stress}}{\text{Strain}} \quad \text{or} \quad E = \frac{\sigma}{\varepsilon}$$

$$1.3 \quad \text{Strain} = \frac{\text{Change in length}}{\text{Original length}} \quad \text{or} \quad \varepsilon = \frac{\Delta l}{o l}$$

$$1.4 \quad A_{\text{shaft}} = \frac{\pi D^2}{4}$$

$$1.5 \quad A_{\text{pipe}} = \frac{\pi (D^2 - d^2)}{4}$$

### 2. PYTHAGORAS' THEOREM AND TRIGONOMETRY



$$2.1 \quad \sin \theta = \frac{y}{r}$$

$$2.2 \quad \cos \theta = \frac{x}{r}$$

$$2.3 \quad \tan \theta = \frac{y}{x}$$

$$2.4 \quad r^2 = x^2 + y^2 \quad \text{or} \quad a^2 = b^2 + c^2$$

### 3. TEMPLATES AND DEVELOPMENTS

$$3.1 \quad \begin{aligned} \text{Mean } \varnothing &= \text{Outside } \varnothing - \text{Plate thickness} \quad \text{or} \\ \text{Mean } \varnothing &= \text{Inside } \varnothing + \text{Plate thickness} \end{aligned}$$

$$3.2 \quad \text{Mean circumference} = \pi \times \text{Mean } \varnothing$$