Exam 1 Equation Sheet

Law of Sines

$$\frac{\sin(\alpha)}{a} = \frac{\sin(\beta)}{b} = \frac{\sin(\gamma)}{c}$$

Law of Cosines

$$c^2 = a^2 + b^2 - 2ab\cos(\gamma)$$

Unit vector

$$\bar{e} = \frac{\overline{R}}{R} = \frac{R_x\hat{i} + R_y\hat{j} + R_z\hat{k}}{\sqrt{R_x^2 + R_y^2 + R_z^2}}$$

Dot product of vectors

$$\overline{A} \cdot \overline{B} = A_x B_x + A_y B_y + A_z B_z$$

Force Equilibrium in Two and Three D.

$$\sum F_x = 0 \quad \sum F_y = 0 \quad \sum F_z = 0$$

Normal Stress

$$\sigma = \frac{P}{A}$$

Shear Stress

$$\tau = \frac{P}{A}$$

Bearing Stress

$$\sigma = \frac{P}{td}$$

Stress on an Oblique Plane

$$\tau = \frac{P}{A_o}\cos\theta \sin\theta$$

$$\sigma = \frac{P}{A_o}\cos^2\theta$$