# 2142111 Statics – Class 0-1

Assignment Date: Friday 13 January 2012
Submission Date: In Class

| **Name** | **ID & Email** |
|---|---|

1. Describe the forces and motion of a kicked balled moving in the air as a) a deformable body, b) a rigid body and c) a particle.

2. Identify physical quantities as scalar (s)/vector (v)/others (t) and specify appropriate SI units

| | | | | | |
|---|---|---|---|---|---|
| ....., | volume | ....., | area | ....., | surface |
| ....., | time | ....., | temperature | ....., | mass |
| ....., | work | ....., | power | ....., | energy |
| ....., | torque | ....., | moment | ....., | momentum |
| ....., | displacement | ....., | distance | ....., | density |
| ....., | speed | ....., | velocity | ....., | acceleration |
| ....., | force | ....., | weight | ....., | pressure |
| ....., | stress | ....., | strain | | |

3. Write down the specified governing equations

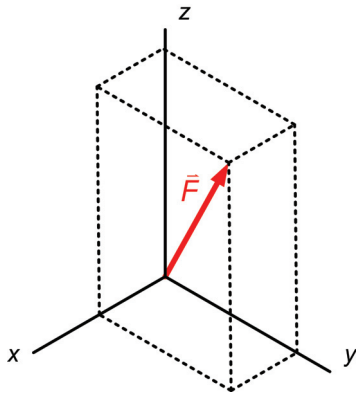
..... Sum of forces is equal to zero in <u>vector</u> form

..... Sum of moments about point *O* is equal to zero in <u>vector</u> form

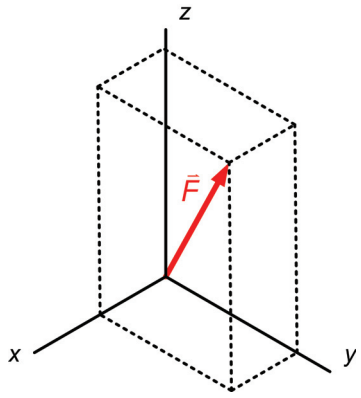
..... Sum of forces in the *x* direction is equal to zero in <u>scalar</u> form

..... Sum of forces in the *x* direction is equal to zero in <u>vector</u> form

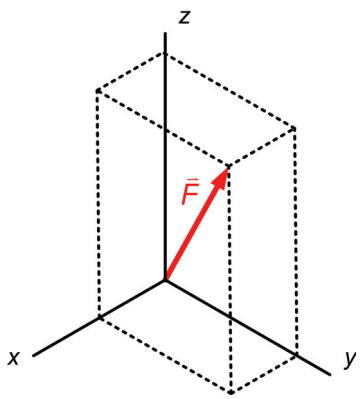
4. Define this tensile force $\vec{F} = 2\hat{i} + 4\hat{j} + 6\hat{k}$ kN ( $F = \sqrt{56}$ kN ) which acts at $O$ by various means.



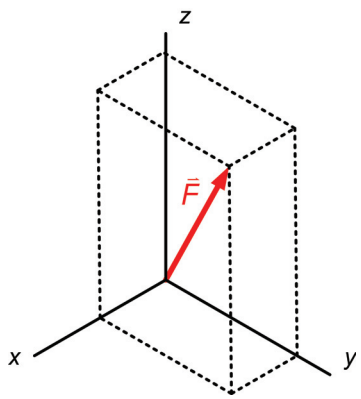

unit vector



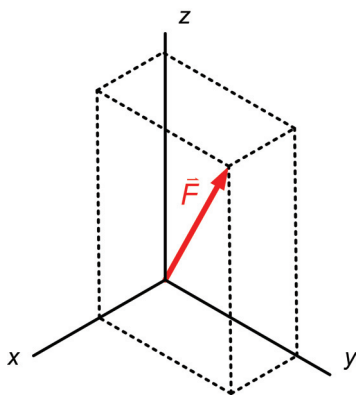

coordinates



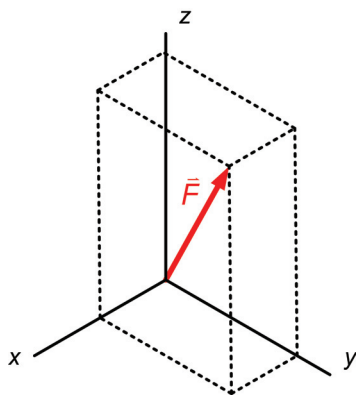

directional cosines




elevated angles, *xy* plane




elevated angles, *yz* plane




elevated angles, *zx* plane