DATE NO.

1. $\cos^2\alpha + \cos^2\beta + \cos^2\gamma = 1$

$\cos\beta = \sqrt{1-\cos^2\alpha-\cos^2\gamma} = \sqrt{1-0.5^2-0.5^2}$

$\cos\beta = 0.707 \quad \beta = 45°$

$\vec{F} = 500 \times \cos 120°\,\vec{i} + 500 \times \cos 45°\,\vec{j} + 500 \times \cos 60°\,\vec{k}$

$= -250\vec{i} + 353.5\vec{j} + 250\vec{k}$

2. $BE(4,3,-2) \quad \vec{u}_{BE} = \frac{4}{\sqrt{29}}\vec{i} + \frac{3}{\sqrt{29}}\vec{j} + \frac{-2}{\sqrt{29}}\vec{k}$

$F_x = \frac{4}{5.39} \times 600 = 445.27N$

$F_y = \frac{3}{5.39} \times 600 = 334N$

$F_z = \frac{-2}{5.39} \times 600 = -222.63N$

$DE(0,3,0) \quad \vec{u}_{DE} = \frac{0}{3}\vec{i} + \frac{3}{3}\vec{j} + \frac{0}{3}\vec{k}$

$F_{DE\parallel} = 334 \times \frac{3}{3} = 334N$

$F_{DE\perp} = \sqrt{600^2 - 334^2} = 498N$