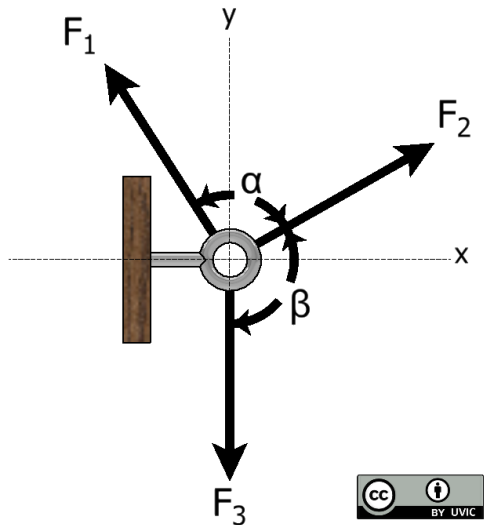


Using rectangular vector components, determine the magnitude of the resultant force and its direction, measured counterclockwise from the positive x-axis. Let $F_1 = 400\text{ N}$, $F_2 = 275\text{ N}$, and $F_3 = 150\text{ N}$. Let the angles be $\alpha = 70^\circ$ and $\beta = 120^\circ$.



The magnitude of the resultant force is $F_R = \text{---} \text{ N}$ and direction $\theta = \text{---}^\circ$

Answer(s) submitted:

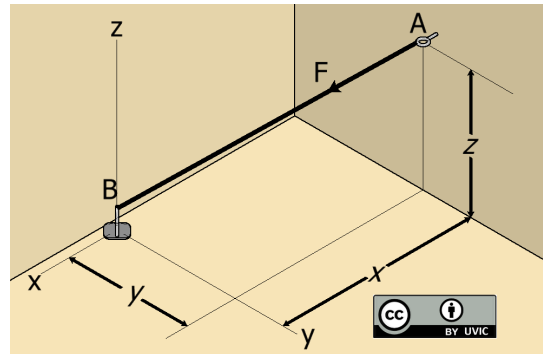
- 417.04
- 66.13

(correct)

2. (3 points)

If cable AB is 11 m long, determine the x, y, z coordinates of point A relative to the reference frame shown below, coordinates may be positive or negative, when the vector force F is:

$$F = [600\mathbf{i} - 200\mathbf{j} - 500\mathbf{k}] \text{ N}$$



The x, y, z coordinates of point A are $x = \text{---} \text{ m}$, $y = \text{---} \text{ m}$, $z = \text{---} \text{ m}$

Answer(s) submitted:

- -8.18629
- 2.72876
- 6.82191

(correct)

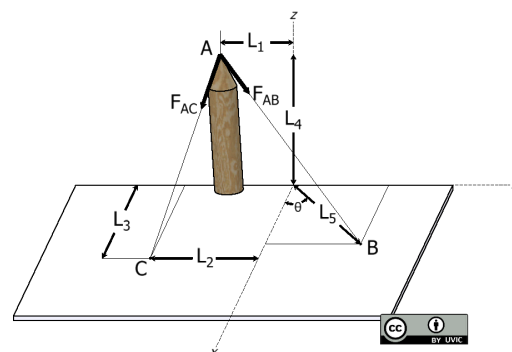
3. (6 points)

Determine the magnitude and coordinate direction angles (α , β , γ) of the resultant force.

Let the lengths be $L_1 = 0.25\text{ m}$, $L_2 = 1.1\text{ m}$, $L_3 = 2.1\text{ m}$, $L_4 = 3.25\text{ m}$ and $L_5 = 1.6\text{ m}$.

Let the Forces be $F_{AC} = 500\text{ N}$ and $F_{AB} = 300\text{ N}$.

Let the angle be $\theta = 30^\circ$.



The magnitude of the resultant force is: $F = \text{---} \text{ N}$.

The direction angles are: α ($x\text{-dir}$) = ---° , β ($y\text{-dir}$) = ---° and γ ($z\text{-dir}$) = ---°

Answer(s) submitted:

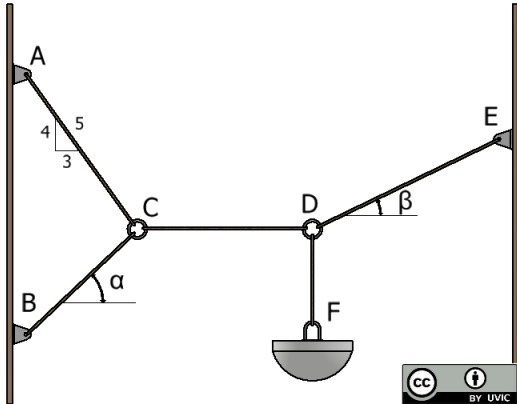
- 773.59
- 60.79
- 91.6158526
- 150.72

(correct)

4. (3 points)

Determine the tension developed in each cord required for equilibrium of the 30 kg block.

Let the angles be $\alpha = 45^\circ$ and $\beta = 35^\circ$.



The tension in each cord is: $F_{DE} = \text{---}N$, $F_{CD} = \text{---}N$, $F_{CB} = \text{---}N$, $F_{CA} = \text{---}N$

Answer(s) submitted:

- 512.9211755
- 420.1604295
- 339.5409

• 300.11459

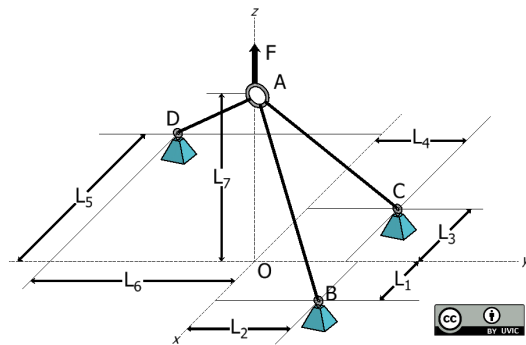
(correct)

5. (6 points)

Three rods are sustaining a force F . Determine the force along each rod for equilibrium. The forces may be positive (tension) or negative (compression).

Let the lengths be $L_1 = 4.5m$, $L_2 = 4m$, $L_3 = 4.5m$, $L_4 = 6.5m$, $L_5 = 2.5m$, $L_6 = 6m$ and $L_7 = 5m$.

Let the Force be $F = 950\text{ N}$.



The tension in each cable is: $F_{AB} = \text{---}N$, $F_{AC} = \text{---}N$, $F_{AD} = \text{---}N$

Answer(s) submitted:

- 598.2522
- 281.0594
- 684.8463

(correct)