Arfaz Hossain
eng141-2023-01
Assignment HW3_2023 due 03/06/2023 at 11:59pm PST

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1. (4 points)

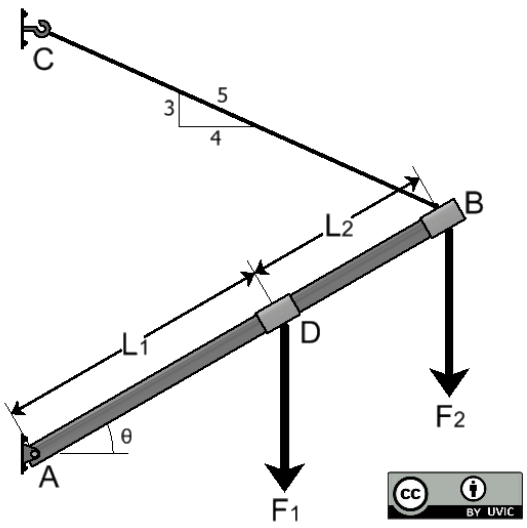
In the figure below the maximum load the cable CB can sustain is T = 1700.

Determine the magnitude of the forces F_1 and F_2 before the cable snaps, knowing that $F_1 = 2*F_2$.

Determine the magnitude of the total reaction force at pin A before the cable snaps.

Let the lengths be: $L_1 = 1.6m$, $L_2 = 1.4m$.

Let angle be: $\theta = 30°$



The magnitude of the forces acting on the pipe are: $F_1 =$ ___N, $F_2 =$ ___N.

The total magnitude of the reaction force at pin A is: $F_A =$ ___N.

Answer(s) submitted:

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(incorrect)

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2. (5 points)

An L-shaped member is supported by cable BC and by a square rod that fits loosely through the square hole of the collar at A.

If the L-shaped member is in equilibrium.

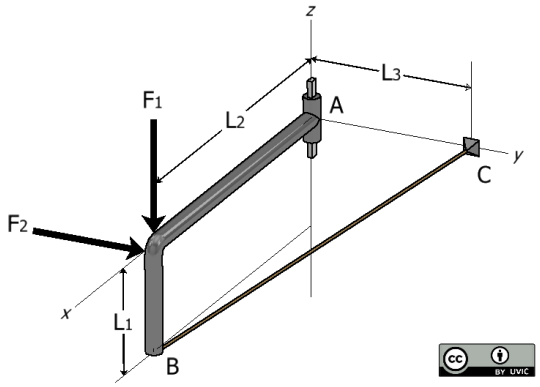
Determine the tension in the cable.

Determine the components of reaction moment at A.

Let the lengths be: $L_1 = 0.8m$, $L_2 = 3.9m$, $L_3 = 1.6m$.

Let the forces be: $F_1 = 300N$, $F_2 = 100N$.

While solving this question please assume on your free body diagram (FBD) that the reaction forces at point A are positive. If you obtain a negative answer, enter the negative value in the box, this indicates that the reaction force is in the opposite direction relative to the initial direction of the force as indicated on the FBD.



The tension in the cable is: $T_{BC} =$ ___N.

The reaction force at A is: $A_x =$ ___N and $A_y =$ ___N

The reaction moment at A is: $M_{Ax} =$ ___Nm, M_{Ay} ___Nm, M_{Az} ___Nm.

Answer(s) submitted:

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(incorrect)

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3. (5 points)

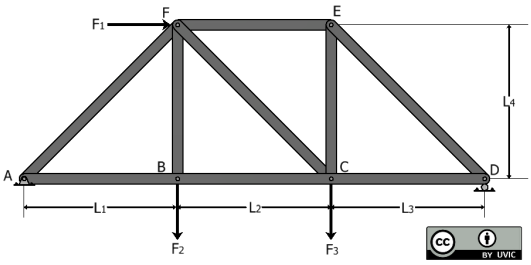
a. Using the figure below determine the magnitude of the reactions at A and D.

b. Using either the nodes or section method. Determine the force in the members EF, FC, BC, and EC, of the truss.

Indicate whether the force is in tension or compression by adding a negative sign to the compressive force. Please assume that all trusses are in tension while drawing your initial free body diagram.

Let the lengths be: $L_1 = 2.9m$, $L_2 = 3.8m$, $L_3 = 3m$, $L_4 = 3.3m$.

Let the forces be: $P_1 = 900N$, $P_2 = 1000N$, $P_3 = 400N$.



The magnitude of the reaction at A is: $F_{Ax} =$ ___N, $F_{Ay} =$ ___N.

The magnitude of the reaction at D is: $F_{Dx} =$ ___N, $F_{Dy} =$ ___N.

The force in the members are: $F_{FE} =$ ___N, $F_{BC} =$ ___N, $F_{FC} =$ ___N, $F_{FB} =$ ___N.

Answer(s) submitted:

(incorrect)

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4. (3 points)

For the structure shown below, a cable sustains a force F, and there is a pulley at E.

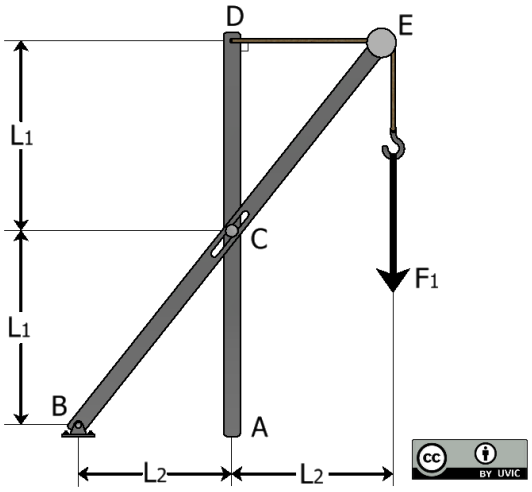
Determine the horizontal and vertical force components at pin B.

Determine the normal force at pin C.

Determine moment and the horizontal and vertical reaction forces at pin A.

Let the lengths be: $L_1 = 2.4ft$, $L_2 = 2.3ft$.

Let the force be: F = $900lb$.



While solving this question please assume on your free body diagram (FBD) that the reaction forces are positive. If you obtain a negative answer, enter the negative value in the box, this indicates that the reaction force is in the opposite direction relative to the initial direction of the force as indicated on the FBD.

The reaction forces at pin B are: $F_{Bx} =$ ___$ftlb$, $F_{By} =$ ___$ftlb$.

The normal force at pin C is: $N_C =$ ___$ftlb$.

The moment at pin A is: $M_A =$ ___$pdlft$.

The reaction forces at pin A are: $F_{Ax} =$ ___$ftlb$, $F_{Ay} =$ ___$ftlb$.

Answer(s) submitted:

(incorrect)

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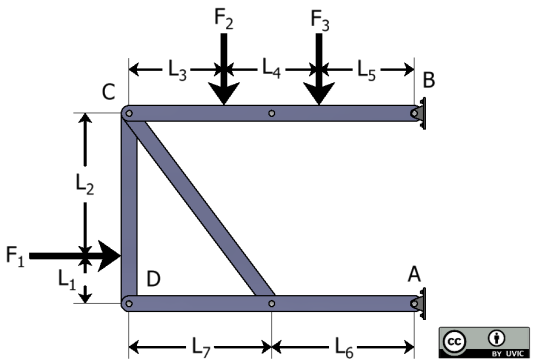
5. (3 points)

Determine the magnitude of the horizontal and vertical components of the force that pin A exerts on the frame.

Determine the magnitude of the horizontal and vertical components of the force that pin B exerts on the frame.

Let the lengths be: $L_1 = 2m$, $L_2 = 3m$, $L_3 = 2m$, $L_4 = 2m$.

Let the forces be: $F_1 = 3.5kN$, $F_2 = 2kN$, $F_3 = 4kN$.



While solving this question please assume on your free body diagram (FBD) that the reaction forces at joints A and B are positive. If you obtain a negative answer, enter the negative value in the box, this indicates that the reaction force is in the opposite direction relative to the initial direction of the force as indicated on the FBD.

The magnitude of the reaction forces at pin A are: $F_{Ax} =$ ___kN, $F_{Ay} =$ ___kN.

The magnitude of the reaction forces at pin B are: $F_{Bx} =$ ___kN, $F_{By} =$ ___kN.

Answer(s) submitted:

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(incorrect)