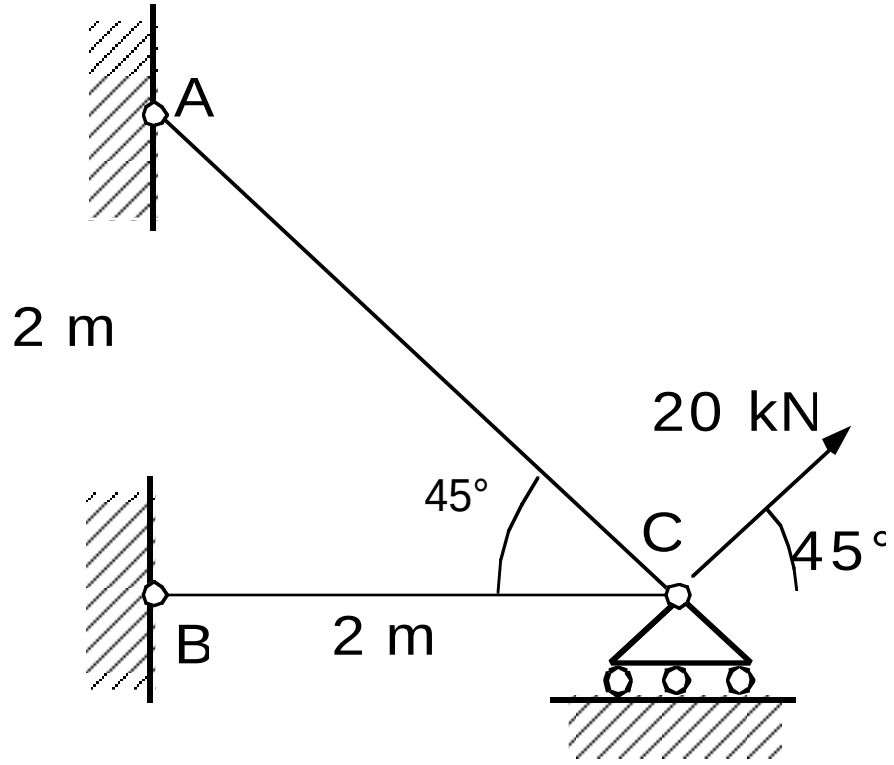
M5 Concept Question 1

A two bar truss structure is **pinned** to a wall at points A and B and is loaded by a 20 kN load at an angle of 45°at point C. Point C is also supported by a roller. Draw a free body diagram for this structure and write down the equilibrium equations and state whether you can solve them given the information provided.

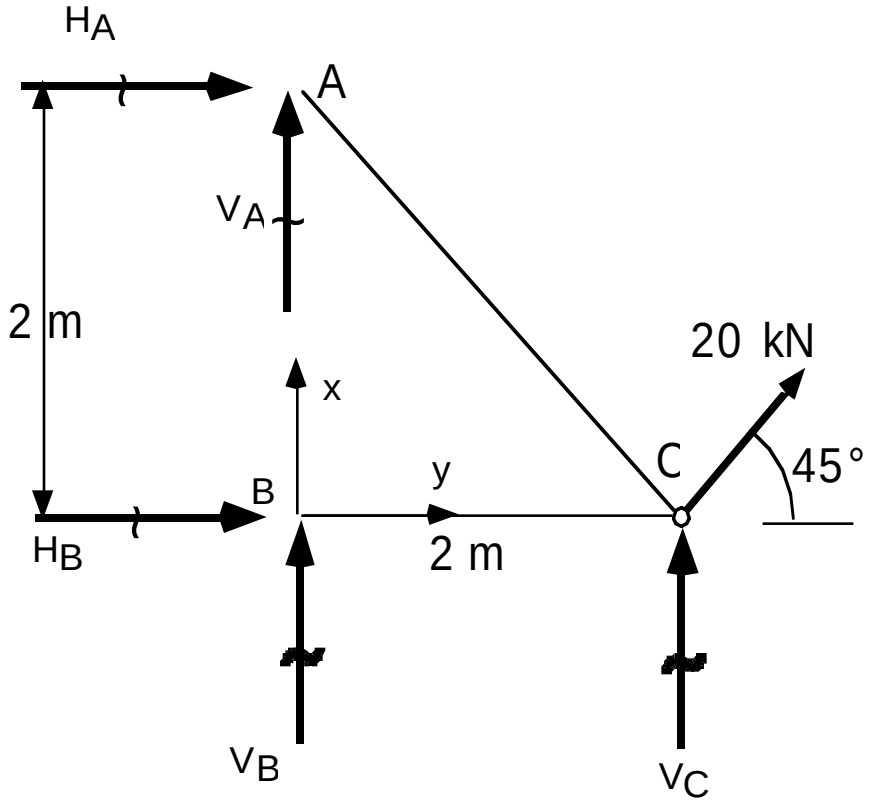


Assess your level of confidence in your answer

1. >80%
2. 60-80%
3. 40-60%
4. 20-40%
5. <20%

M4 Concept Question 1 Solution

Free Body Diagram



Equilibrium of forces in x direction

$$\sum \dot{F}_x = 0 : H_A + H_B + 20\cos 45^\circ = 0$$

Equilibrium of forces in y direction

$$\sum F_y \uparrow = 0 : V_A + V_B + V_C + 20\sin 45^\circ = 0$$

Equilibrium of forces in z direction

$$\sum M_C \curvearrowleft = 0 : 2.H_A + 2.V_A + 2.V_B = 0$$

3 equations, 5 unknowns - cannot solve with this information!!!

M5 CQ 1 Student Self Evaluation

Please evaluate your solution and understanding

1. Totally correct
2. Minor errors
3. Major errors, but think I understand concepts
4. Major errors and do not understand concept
5. Do not know where to start