

Problem of the day

RULES AND EXPECTATIONS: This is just for fun and exercise. Enjoy it! Solutions will be posted shortly on the course website.

EXERCISE: A suspended ceiling panel is supported by three cables vertical cables. The panel weighs 500N. Determine the tension in each of the three cables.

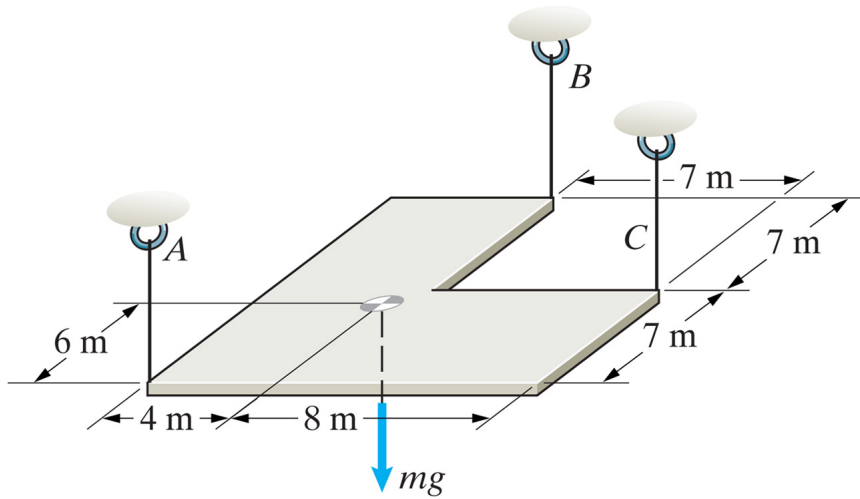


Figure: 05-18-27P5.93 - Problem 5.93
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RULES AND EXPECTATIONS: This is just for fun and exercise. Enjoy it! Solutions will be posted shortly on the course website.

EXERCISE: The weight $W = 90$ lb. Determine the internal force in bar AC, and whether it is in tension or compression. All joints are pin-connected.

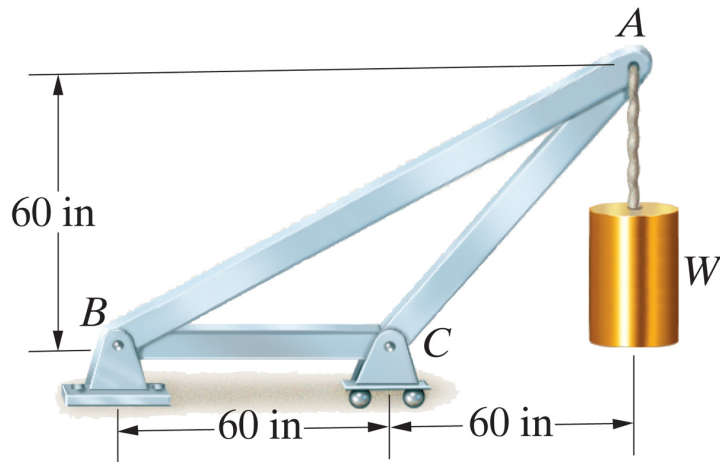


Figure: 06-11-11P6.3 - Problem 6.3
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RULES AND EXPECTATIONS: This is just for fun and exercise. Enjoy it! Solutions will be posted shortly on the course website.

After solving, try going through the *I've totally mastered this!* checklist:

1. Find a different way to solve it.
2. Make another problem of similar difficulty.
3. Make another similar problem that's harder. Explain why it's harder.
4. Explain how you solved the problem.
5. Describe a problem from another subject similar to that this. (When you can do this, you've totally mastered the concepts here.)

EXERCISE: The weights have mass $m = 30$ kg. Determine the internal force in bar AD, and whether it is in tension or compression. All joints are pin-connected.

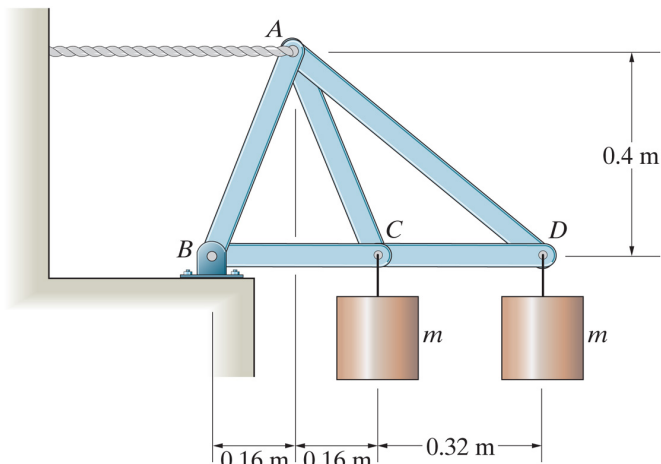


Figure: 06-11-13P6.5 - Problem 6.5
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After solving, try going through the *I've totally mastered this!* checklist of expert extension questions:

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EXERCISE: The bridge is supported by a pin support at A, and a roller support at H. All joints are pin-connected.

- a) Determine the force within member BD. What could you change about the bridge design to reduce this load?
- b) Determine the force in DE. Surprised?

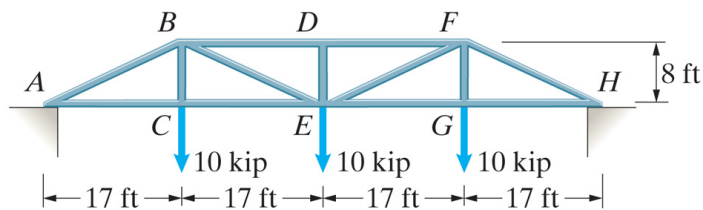


Figure: 06-11-15P6.7 - Problems 6.7/6.8
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EXERCISE: Determine the GD internal force, that is, determine the internal force in bars GD, GE, and DF, and whether each is in tension or compression. All joints are pin-connected.

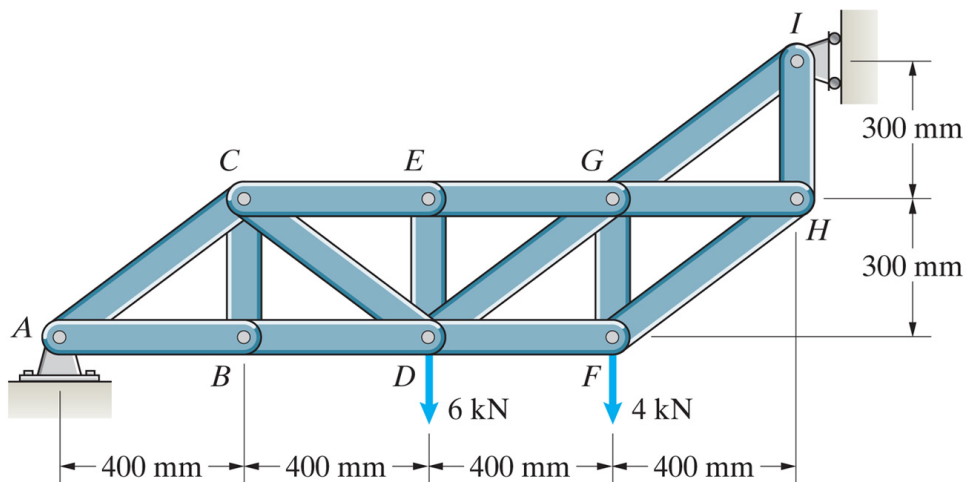


Figure: 06-13-16P6.45 - Problems 6.45/6.46
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EXERCISE: Determine the axial forces in members AD, AB, DE, and DG. Model all joints as pin-connected, and model the supports at A and I as roller supports.

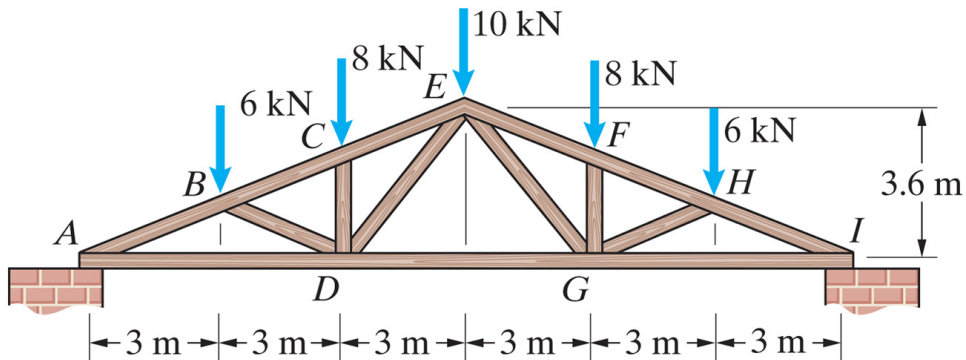


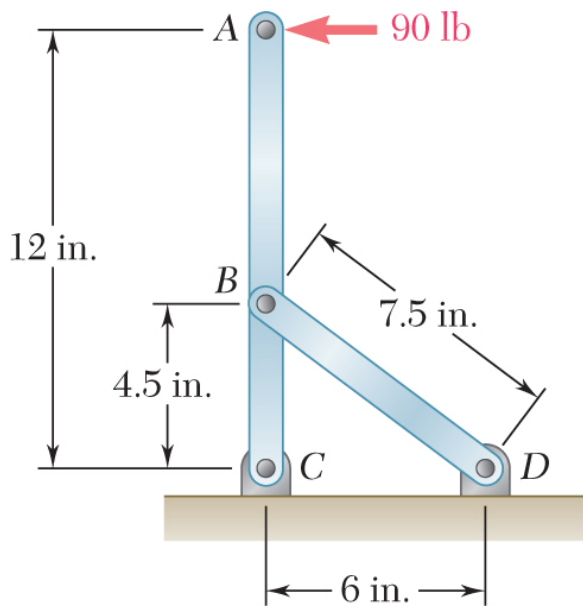
Figure: 06-11-31P6.25 - Problem 6.25
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EXERCISE: Determine the axial forces in member BD and the reactions at C.

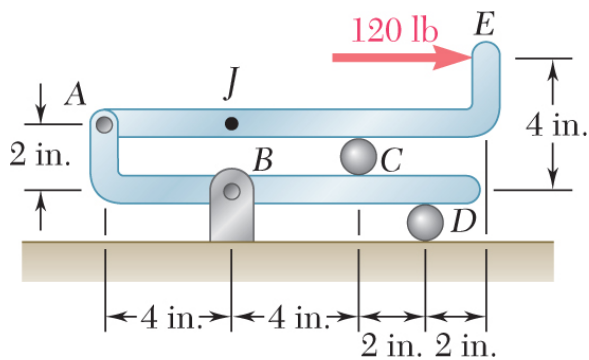


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EXERCISE: Determine all the forces acting on member ABCD resulting from the applied 120 lb load.

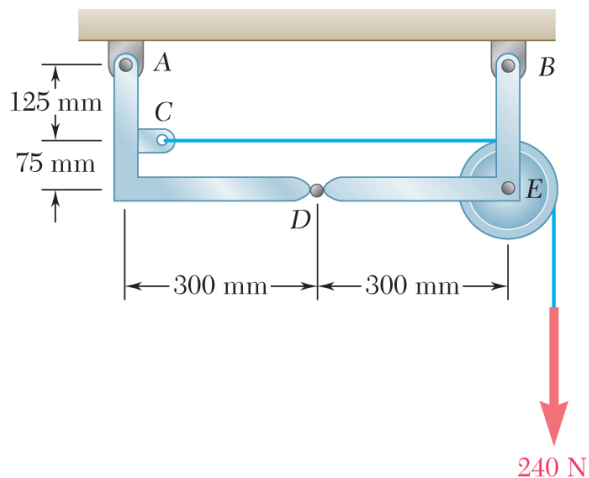


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EXERCISE: Determine the reactions at A and B, and the contact forces at D resulting from the applied 240 N load.

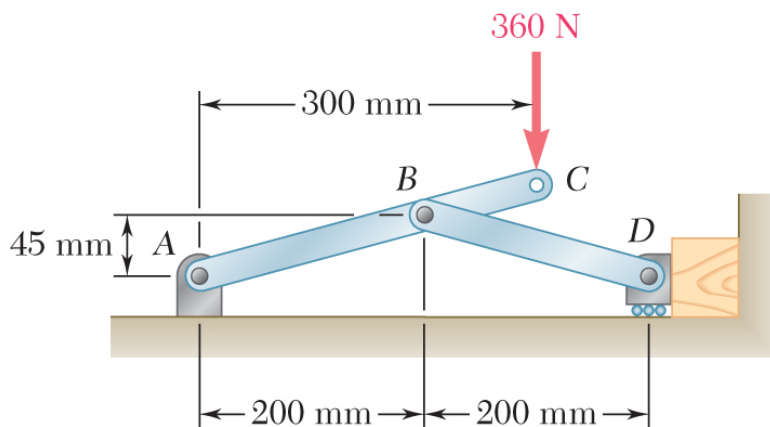


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EXERCISE: The device shown is a “toggle vice”. Determine the force exerted on the block at D and the force exerted on ABC at B, by the bar BD.



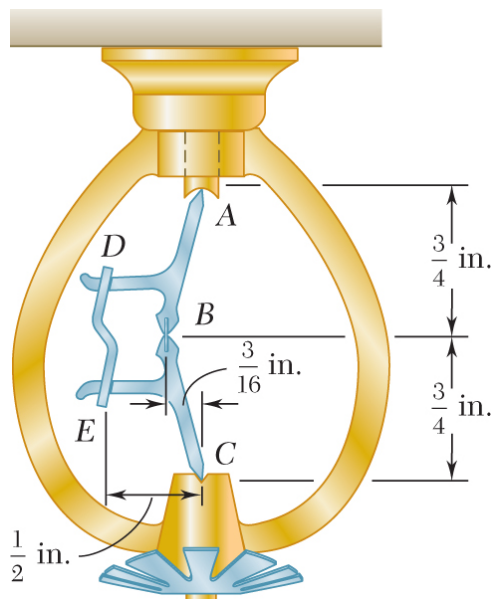
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EXERCISE: Shown is a fire sprinkler, like those on the ceilings of many public buildings. When the fusible link DE is broken, the sprinkler is activated. In its off state, water pressure exerts a force of 30 lb on the plug valve at A, which is held in place by the (intact) fusible link DE. Elements ABD and CBE are connected by a hinge joint at B.

Determine the tension in DE (pretend it's straight) and the contact force at B.



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EXERCISE: The gear puller works by screwing the center rod (JK) through the crosshead (CF). This action pushes the axle KL off the gear AH. Suppose that a force of 5200N is required to push the axle through the gear. Determine the forces acting on ABC.

