## Practice Problems – Short Documentation (12 points)For these 3 problems, the Given, Find, and Solution are the only required documentation.

1. The truss shown below is made of three aluminum members with cross-sectional area A = 850 mm2, and elastic modulus E = 70 GPa. Dimensions are: a = 7.0 m, b = 4.5 m, and c = 5.0 m. Calculate the horizontal displacement of A when loads P = 12 kN and Q = 30 kN.



1. A pin-connected structure is shown in the figure below. Member ABCD is a rigid bar, and members (1) and (2) are aluminum, both with cross-sectional area A = 160 mm2, and modulus of elasticity E = 70 GPa. Member (1) is originally 900 mm long, and member (2) is originally 1250 mm long. After load P = 35 kN is applied, calculate the following:
	1. Axial forces in members (1) and (2)
	2. Normal stress in members (1) and (2)
	3. Vertical displacement of point D



1. An aluminum alloy, pipe (1) is connected to bronze, pipe (2) with a flange at B. Supports at A and C are rigid and do no move. Properties for the pipes are:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Pipe | Outer Diameter [in] | Wall Thickness [in] | Length [ft] | Modulus [ksi] | σy [ksi] |
| (1) | 2.375 | 0.203 | 6 | 10,000 | 40 |
| (2) | 4.50 | 0.226 | 10 | 16,000 | 45 |

If a minimum factor of safety of 1.67 is required for each pipe, calculate the following:

* 1. Maximum load P that can be applied
	2. Deflection of the flange B from the load in part (a)



## Preparation for Next Class Period (4 points)

Your next class period is just a review of chapters 1-5. There isn’t any new material to cover. But I still want you to come to class prepared with a few questions in mind.

1. Look back through the last 11 homework assignments.
	1. What problem (or types of problems) do you still have difficulty with?
	2. For the problems you struggle with, what part of the problem are you hanging up on? (i.e. visualizing the problem, setup, equations, variable definitions, solution, etc.)
2. What is one way in which you plan to prepare for the exam?