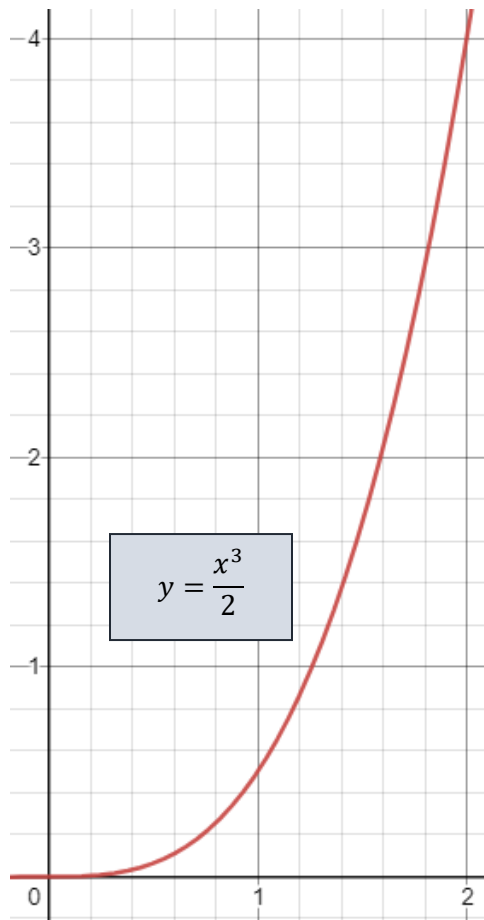


Statics SI Worksheet 12

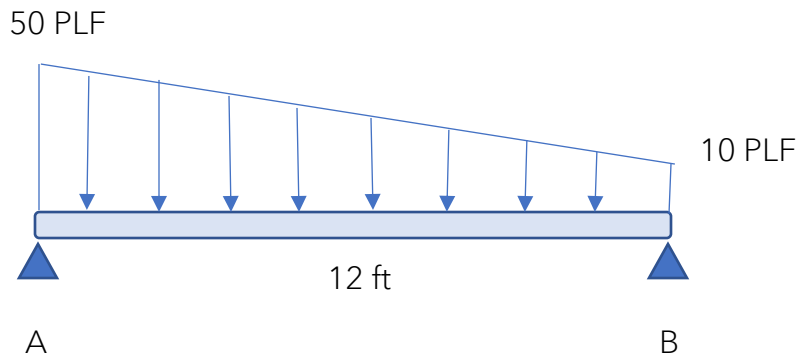
1. The center of gravity can pass through more than one point.
 - a. True
 - b. False
2. If a body is made from a homogenous material, its density will be constant.
 - a. True
 - b. False
3. Density is the same as unit weight.
 - a. True
 - b. False
4. If an object is symmetrical in both the x and y directions, but not homogenous, the centroid is the geometric center.
 - a. True
 - b. False
5. The magnitude of the resultant force is equal to the total area under the distributed load.
 - a. True
 - b. False
6. The resultant force of a distributed load always passes through the middle of the beam.
 - a. True
 - b. False
7. Specific weight times depth is the same as density times gravity times depth.
 - a. True
 - b. False
8. In truss analysis two assumptions are made: all loadings are applied at the joints, and the members are joined together by smooth pins.
 - a. True
 - b. False
9. What are the equations used in method of joints?
10. What are the equations used in method of sections?

11. The slide you designed for a new elementary school is wildly unsafe. Your boss tells you absolutely not and asks for the centroid of the entire area under the slide so she can come up with the proper supports. If your slide design is given below, and goes from 0 to 2, where is the centroid located?



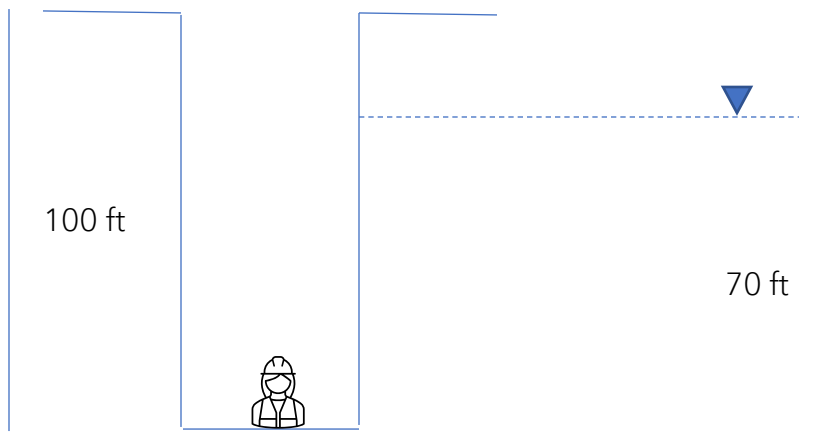
12. What centroid method should you use if you're given mainstream shapes?

13. You are at work and finally get to go see what is in the attic. Turns out, all the old guys are hoarders and have saved every piece of paper since the 50s. The flooring has a load of 10 lb/ft, and all their stuff (mostly on one side) is given by a 50 lb/ft triangular loading. If the loading can be described below, what is the resultant force?

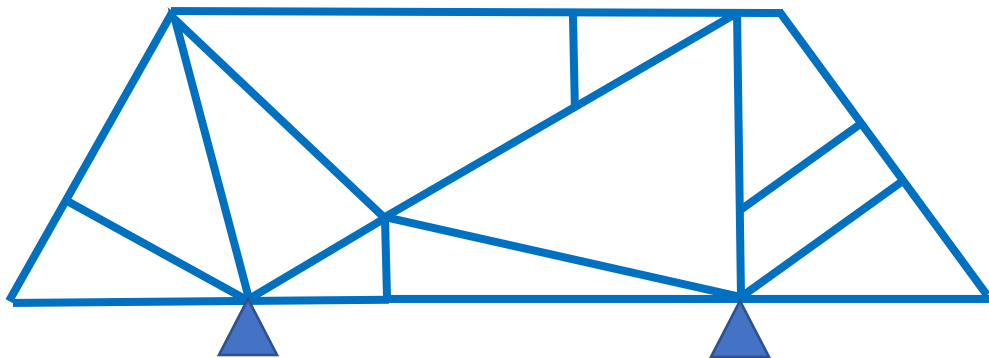


14. What load do the floor beam connections in problem 13 need to resist so they don't collapse? (Solve A and B)

15. You're a really cool engineer girl who gets to go in giant water wells in the summer. If the walls are rectangular concrete slabs with a width of 10 ft, and you're 100 ft in the ground with a water table located 70' above you, what is the resultant total force pushing on the well wall? (neglect lateral earth pressure)



16. The architect designs a ~pretty~ truss. You tell them they could save a ton of money if they got rid of some of their useless members. They tell you that they're all equally important. Prove them wrong and identify the zero force members.



17. You're making a truss awning for your future tiny house. You want to hang a 100 lb heavy bag off the edge and you assume you're probably going to stand on the roof one day. If you weigh 200 lb, what force must each member resist?

