

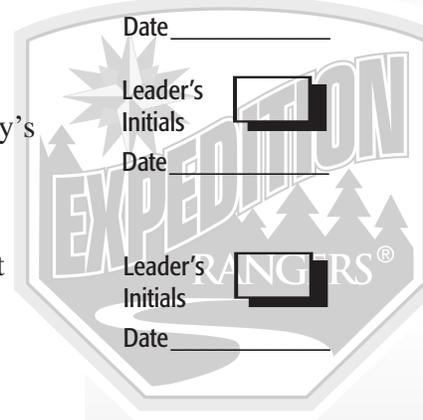


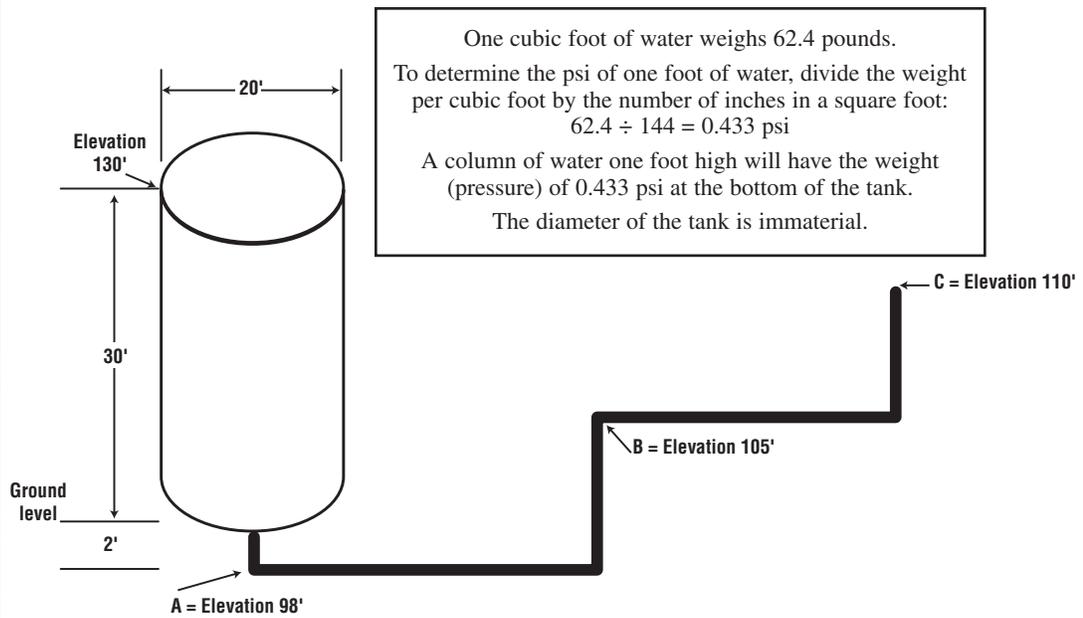
Engineering Merit

1. Define the terms *engineering* and *engineer*.
2. List at least six specialties in the engineering field. Describe each specialty's area of work.
3. Write a three-hundred-word report describing some interesting facts about the history of engineering and how the field has developed over the years. List all sources used for your research.
4. Select an engineering achievement that has had a major effect on society in the last century and the engineer credited for this accomplishment. Write a three-hundred-word report on this engineer and the achievement's influence in today's society.
5. Select three tools used in an industry, such as plumbing, woodworking, automotive, etc. Examine how they are made, what materials they are made from, as well as design, shape, etc. Write a brief description of each tool, including how it is made, materials used in the tool, as well as design, shape, etc.
6. Design and draw a tool of your own. Include the tool specifications and purpose of the tool. Build a working device or a model of the tool.
7. Do the following:
 - a. Calculate the water pressure in pounds per square inch (psi) at elevation points a, b, and c in the illustrated water tank full of water. The water tank is 30 feet tall and is at an elevation of 100 feet above sea level. Show all of the math steps to explain the differences in pressure at the various altitudes.

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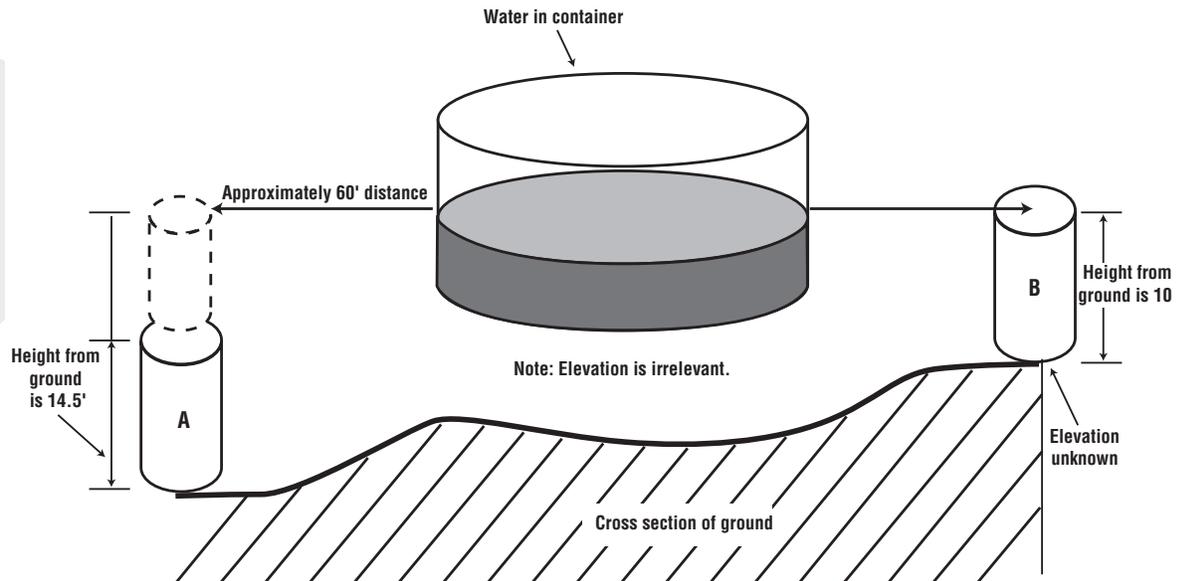


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b. A box contains a hundred bees. What is the difference in the weight of the box when all of the bees are resting on its floor and the weight of the box when all of the bees are flying? Explain your answer.

8. Complete TWO of the following. Show each step of each problem and all math computations.

a. Illustrate how to use a water level to establish level from one platform surface to another. Determine how much of an addition is needed for tank A to be at the same height as tank B.

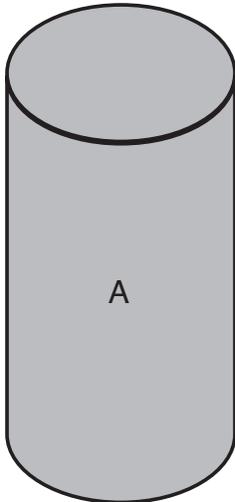


b. A new housing track of 450 homes is being built at the same elevation of 1,000 feet above sea level. The county regulations applying to this model community are the following: (1) Each home must have at the minimum



40 pounds per square inch of water pressure at the entrance to the home. (2) The water system must be able to deliver 500 gallons per day per person. (3) The average number of people per house is 2.5 persons. (4) There must be a two-day demand of storage capacity. This would be a gravity fed tank servicing the community. Calculate the needed tank capacity, the required elevation for the tank, and the necessary tank height to maintain a minimum 40 psi for the required period of time.

- c. Determine which tank design would be more suitable for the water pressure needs in the project described in b. List each design's advantages and disadvantages. Show your math computations.

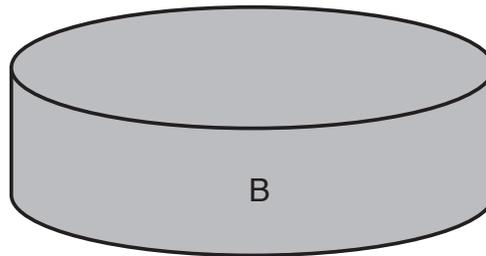


Notes: Both tanks require the same volume or holding capacity.

There are 7.49 gallons of water in a cubic foot.

Tank A is 40 feet wide.

Tank B is 10 feet tall.



9. Complete the following.

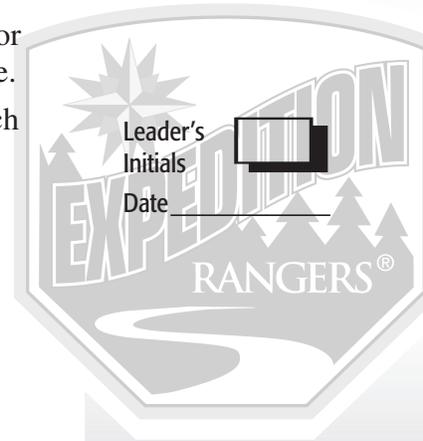
- List the educational requirements for becoming an engineer.
- List how many years experience and what qualifications are required for an entry-level engineering job. Include what you can do now to prepare.
- Explain why is it desirable to belong to a professional organization such as the American Society of Mechanical Engineers.
- Describe the "code of ethics for engineers."

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