QUIZ / Mechanics - Center of Mass

NAME DATE CLASS PERIOD

Put a check ☐ in the o *next to the correct answer.*

1. **Why is it important to know where the center of mass of an object is?**

   o It is the point of application of gravity, acceleration, and momentum vectors on an object

   o It is always the center of rotation of an object

   o It is not as important as the center of gravity

   o It is the point of application of all foces acting on a body

   o It is the engineering essence of an object

2. **The center of mass of an object always lies on or within the object's mass.**

   o **True**

   o False

3. **If an object has "uniform density," this means ...**

   o Its center of mass lies at its geometric center

   o The object is very heavy

   o Its center of mass cannot be determined accurately

   o Absolutely nothing with regard to its center of mass

   o It can be used in military applications

4. **When determining the position of the center of mass of an object experimentally, what is the minimum number of measurements you must take?**

   o **1**

   o 2

   o **3**

   o **4**

   o **5**

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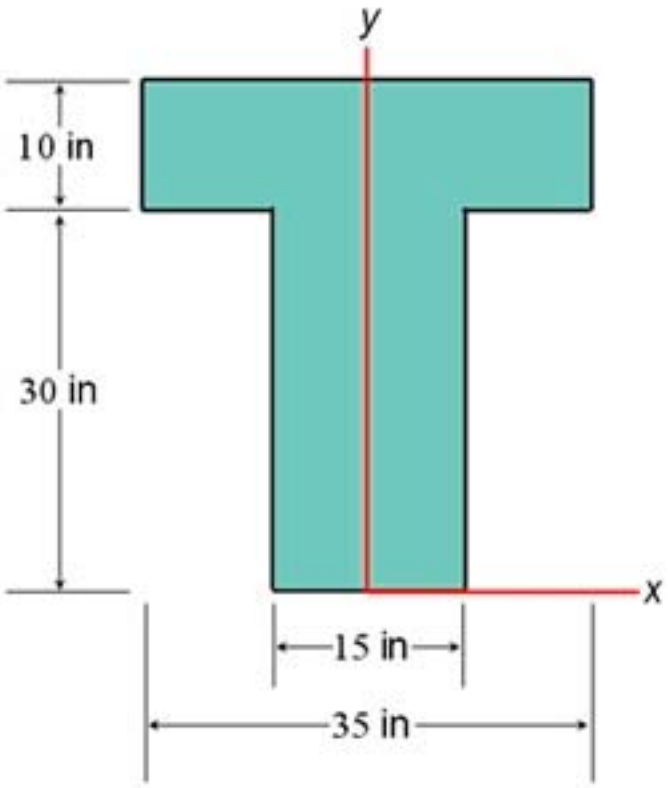
Questions 5 through 9 deal with finding the center of mass of the uniformly dense, 2-D object shown. It's center of mass will lie at its centroid. You will compute the position of its centroid relative to the given frame of reference, in parts, over the next few questions.



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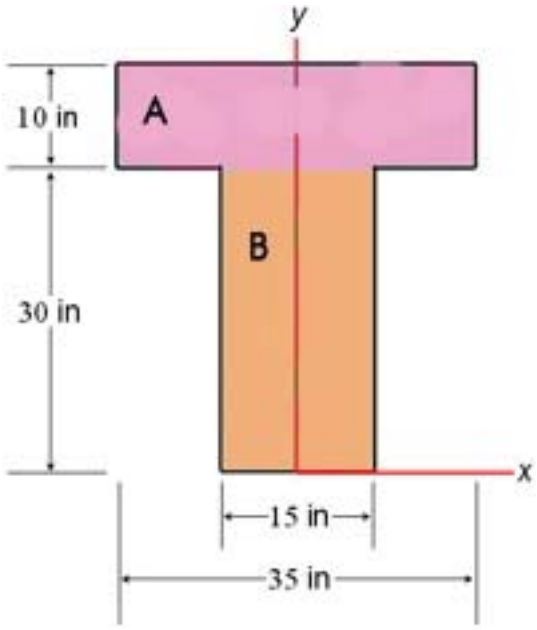
5. **Say you break the object up into the following two shapes, A and B. The area of A is 50 in². The area of B is ...**



- o 450 in2
- o **1400 in²**
- o **350 in²**
- o **350 ft²**

6. **The shapes we've selected share a line of symmetry. That line will make it easy to determine $\overline{y}$.**
   - o **True**
   - o False
7. **For shape A, determine the position of $\overline{y}$.**
   - o 35 in
   - o **30 in**
   - o **15 in**
   - o **17.5 in**
8. **For shape B, determine the position of $\overline{y}$.**
   - o 15 in
   - o **30 in**
   - o **35 in**
   - o **17.5 in**

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9. Now, for the entire shape, ($\bar{x}$, $\bar{y}$) =

- o (0, 23.8) in
- o (0, 31.8) in
- o (31.8, 0) in
- o (17.5, 15) in
- o (17.5, 23.8) in