QUIZ 05: THERMAL EXPANSION

d (cm)	L_o (cm)	θ (°)	T_i (°C)	T_f (°C)	ΔT (°C)	ΔL (cm)	α (/°C)
0.23	86.0	36	22	100			

1. What is the change in temperature of the rod, ΔT?
   A) 22°C B) 78°C C) 88°C D) 122°C
2. What is the change in rod length, ΔL?
   A) 0.072 cm B) 0.126 cm C) 0.175 cm D) 0.549 cm
3. The coefficient of thermal expansion of this rod is closest to
   A) 1.08×10^{-5}/°C B) 1.14×10^{-5}/°C C) 1.89×10^{-5}/°C D) 1.92×10^{-5}/°C
4. This rod is most likely made of
   A) wood. B) glass. C) iron. D) brass.
5. Based on your answer to question 4, what is the percent error in your value of the coefficient?
   A) 1.8% B) 3.0% C) 4.2% D) 5.5%
6. True or false: A 1−m iron rod will expand more than a 1−m brass rod, given the same temperature change.
7. True or false: A 3−m iron rod will expand more than a 1−m brass rod, given the same temperature change.
8. True or false: If the rod slips on the spindle, the angle will be measured too small, and the calculated coefficient will be smaller than the predicted value.

You have a brass sphere and an iron ring. At room temperature, the ring just barely fits over the sphere.

9. If only the sphere is heated,
   A) no change; the ring still just barely fits over the sphere.
   B) the ring will not fit over the sphere. The sphere is too big.
   C) the ring will slip right over the sphere with room to spare.
10. If only the ring is heated,
    A) no change; the ring still just barely fits over the sphere.
    B) the ring will not fit over the sphere. The sphere is too big.
    C) the ring will slip right over the sphere with room to spare.
11. If both the ring and the sphere are heated to the same final temperature,
    A) no change; the ring still just barely fits over the sphere.
    B) the ring will not fit over the sphere. The sphere is too big.
    C) the ring will slip right over the sphere with room to spare.

For questions 12—15, use the following responses:
   A) Doing this would improve the accuracy of the experiment.
   B) Doing this would decrease the accuracy of the experiment.
   C) Doing this would have no effect on the accuracy of the experiment.

12. Repeat the experiment, using a second rod (of the same material) at room temperature. Average the results for the coefficients.
13. Align the indicator needle with the other zero on the protractor scale.
14. Add more water to the steam generator in between trials.
15. Measure the length of the rod from end to end.