HAIR & FIBER UNIT WORKSHEET

Calculating the medullary index of hair

Recall from your outline notes and handout that the medullary index is calculated by dividing the medullar width by the width of the cortex (see illustration below). Recall also that in humans the value of the medullary index is usually 0.333 or less, and that of animal hair is 0.50 or greater.

Calculation of Medullary index

\[ MI = \frac{\text{width of medulla}}{\text{width of cortex}} = \frac{1}{3} \]

Use a ruler to calculate the medullary index of the following sketches/pictures of hair samples. Please show your work.

1) Medullary index: ______  
2) Medullary index: ______  
3) Medullary index: ______  
4) Medullary index: ______
5) Calculate the medullary index of a hair whose diameter is 110 microns wide and whose medulla measures 58 microns. **Is this a human or animal hair?**

6) Calculate the medullary index of a hair whose diameter is 93 microns wide and whose medulla measures 31 microns. **Is this a human or animal hair?**

**Using growth rate of hair to calculate time since death.**

Human hair grows at the rate of 0.44 mm per day. Use this information to answer the following question.

7) The body of a woman was found in the woods. Some hair fibers found on the body were sent to the crime lab for analysis. The ends of the hair attached to the body were gray, but the tips of the hair showed that it had been dyed. The distance from the root of the hair to the beginning of the dyed area measured 8 mm. Investigators determined that the victim’s hair had last been dyed on August 1, 2004. Assuming the hair grows at the rate of 0.44 mm per day, on approximately what date did the woman die? **Explain your answer.**