Reconstruction Labs

1. Given the following information, calculate the paleolatitude of the North American plate through time. How fast did North America move in between each successive interval of time (give answers in centimeters/year)? Note: 1 degree = 111 kilometers

   580 Ma: Inclination was: 80 degrees
   505 Ma: Inclination was: 15 degrees
   450 Ma: Inclination was: 10 degrees
   400 Ma: Inclination was: 20 degrees

   Formula: \( \tan \text{ Inclination} = 2 \times \tan \text{ latitude} \)

   Could the continent have traveled faster than your estimate? Why or why not?

2. Reconstructing Continents (Paleogeography) using paleomagnetism. Your instructor will explain how continents are reconstructed using Declination and inclination in class. Cut-out the outline of North America (Note, it is smaller than its real size for the purpose of this exercise. Reconstruct North America by moving it on the map to its position and orientation given the following data:

   (a) Declination 90: Inclination: 40: Normal Polarity
   (b) Declination 270: Inclination: 60: Reverse Polarity
   (c) Declination 135: Inclination 20: Reverse Polarity
Each Line = 10 degrees

Sampling Site marked by square
3. There are 4 samples (L1-L4) in the laboratory. Each group (2-3 people) should measure each sample as instructed. Record the following information.

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Declination</th>
<th>Inclination</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-1</td>
<td></td>
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<tr>
<td>L-2</td>
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<td>L-3</td>
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<tr>
<td>L-4</td>
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</tbody>
</table>

Based on the results, given above what two samples are likely to have the same age? Why?

How much rotation took place between the formation of L1 and L2? Does this depend at all on the polarity of the magnetic field?

How much latitudinal motion took place between sample L3 and L4? How much rotation?

Which sample is located closest to the equator?_________
Which sample is located closest to the pole?__________.