

Name: \_\_\_\_\_

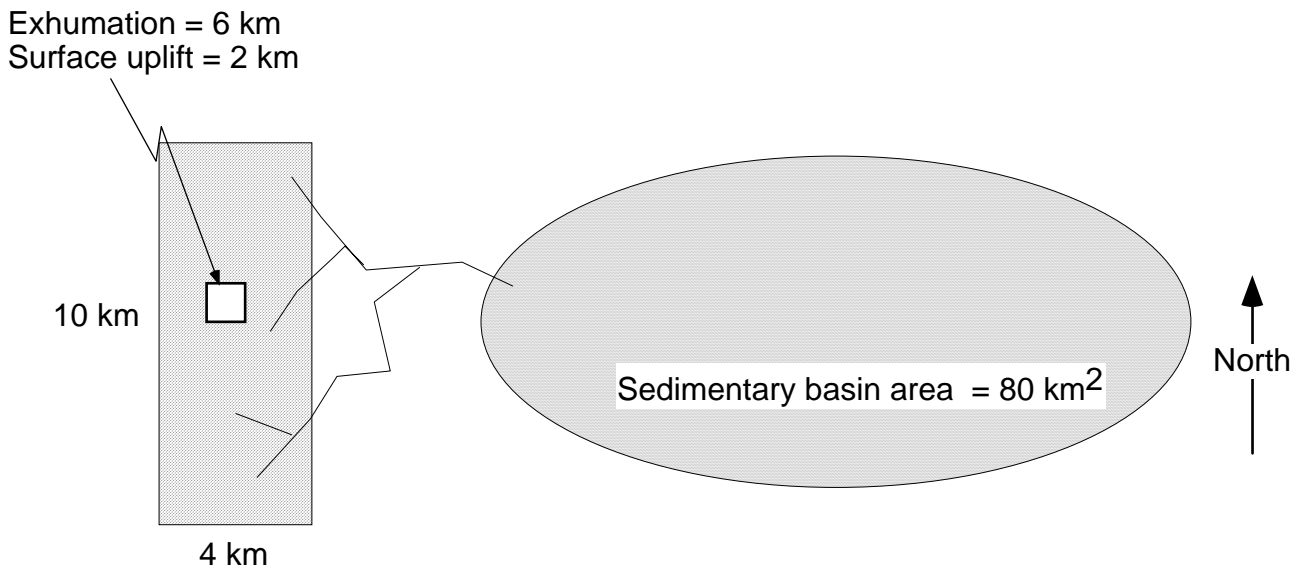
**GLG362/598 Application Exercise—Due Monday, September 25, 2006**

**Exhumation, rock uplift, and surface uplift**

In the map below, you see a rectangular block of rock, data from which indicates that rocks at the surface have been exhumed 6 km in the last 40 million years. Paleobotanic evidence indicates surface uplift of 2 km.

a) Draw a scaled diagram showing the configuration of the rocks relative to the surface at time = 0 (40 million years ago), and one for the present. Indicate the magnitudes of exhumation, surface uplift, and rock uplift. (8 pts)

b) What is the magnitude of rock uplift? (5 pts)



If we assume that the material is uniformly removed by exhumation across the entire uplifting block and all is deposited uniformly across the adjacent 80 km<sup>2</sup> sedimentary basin (see sketch above), what is the expected thickness of the sediments? (5 pts)

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In the cross-section below, you see an uplifted mountain block of rock, data from which indicates that rocks at the surface have been exhumed 4 km in the last 16 million years. At 16 Ma, the region was a shallow sea based on stratigraphic studies elsewhere (elevation = 0 m). Now it is 3 km elevation at the top of the mountain.

a) Draw a scaled diagram showing the configuration of the rocks relative to the surface at time = 0 (16 million years ago), and one for the present. Indicate the magnitudes of exhumation, surface uplift, and rock uplift. (8 pts)

b) What is the magnitude of rock uplift? (5 pts)

If we assume that the material is uniformly removed by exhumation across the entire uplifting block (map area = 30 km<sup>2</sup>) and all is deposited uniformly across the adjacent 120 km<sup>2</sup> sedimentary basin (sketch shows cross section through basin), what is the expected thickness of the sediments? (5 pts)

