

Examination in Structural Geology
(MSc, summer term 2011, 02/11/11, 2 h, 60 pts)

Name:

Immatriculation number:

Problem 1 (7 pt.)



Interpret and name the structures (do not hesitate to draw your interpretation!). (1 pt.)
Indicate with double arrows the senses of shearing an opening. (1 pt.)
Indicate the approximate orientations of σ_1 and σ_3 . (1 pt.)

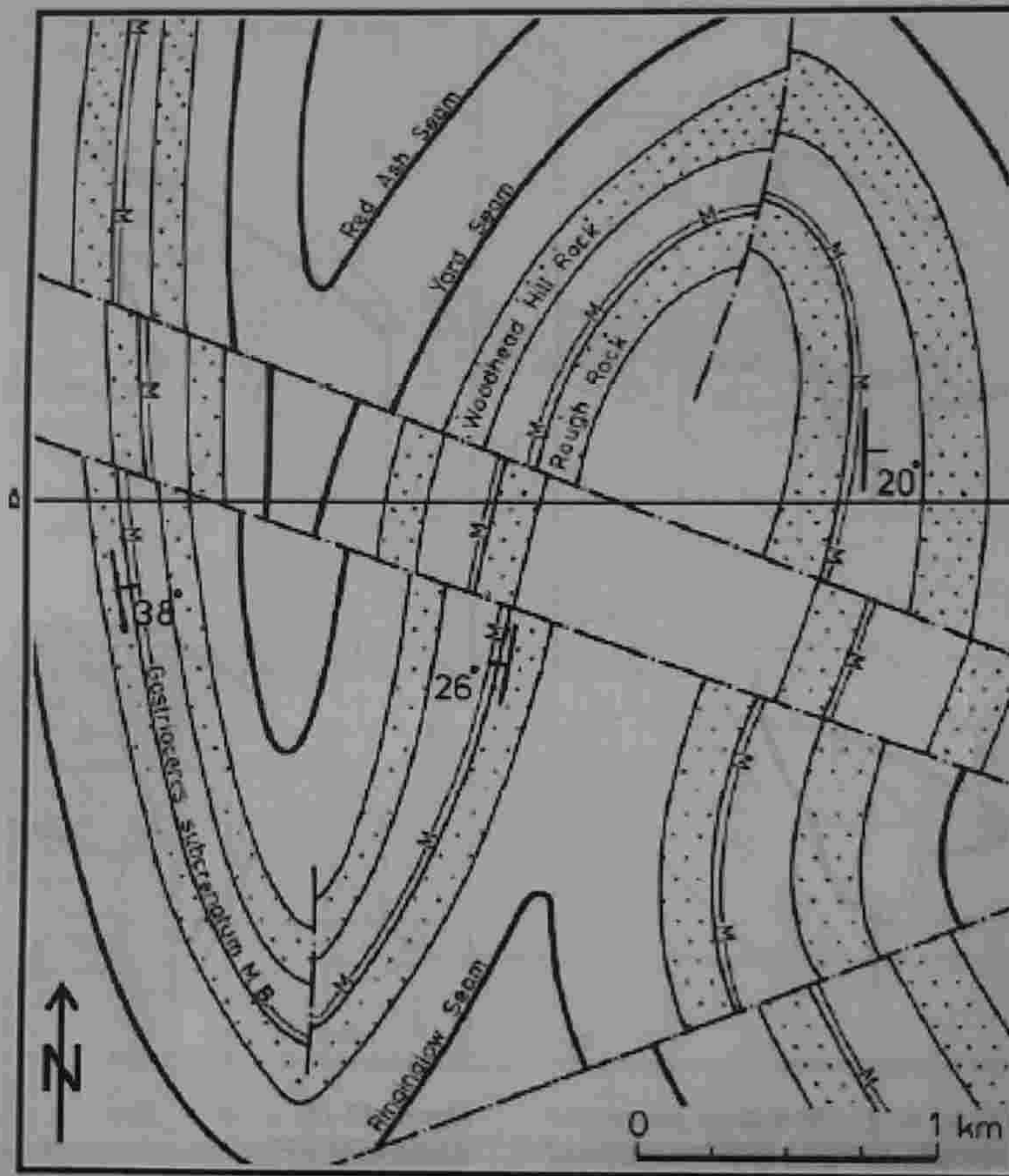


Interpret and name the structures (do not hesitate to draw your interpretation!). (1 pt.)
 What structures in particular allow you to determine the sense of motion? (1 pt.)
 Give the name of these structures. (1 pt.)



Give the name of the structure (the sample on the photo is 2 cm x 5 cm). (1 pt.)

Problem 2 (17 pt.)



The map shows a folded and faulted sedimentary sequence in a flat area. The folded strata are cut by pure dip slip faults.

Indicate on the map:

- (1) antiforms and synforms, (4 pt.)
- (2) the traces of the axial surfaces and the directions of plunge of the fold axes, (3 pt.)
- (3) upthrown and downthrown blocks along the faults. (10 pt.)

Problem 3 (20 pt.)

A thin coal seam of constant bedding attitude is found at locations A (700m), B (600 m) and C (500 m). (*see map on page 5*)

- 1) Determine the attitude of the coal seam using the "three-point method". (5 pt.)
- 2) Determine the outcrop pattern of the coal seam. (8 pt.)
- 3) Colour the area where the coal seam occurs below ground level. (2 pt.)
- 4) Indicate the area where the coal can be found at less than 200m depth. (5 pt.)

GAGA
HHAG
SC+24

$$1 \text{ cm} = 100 \text{ m}$$

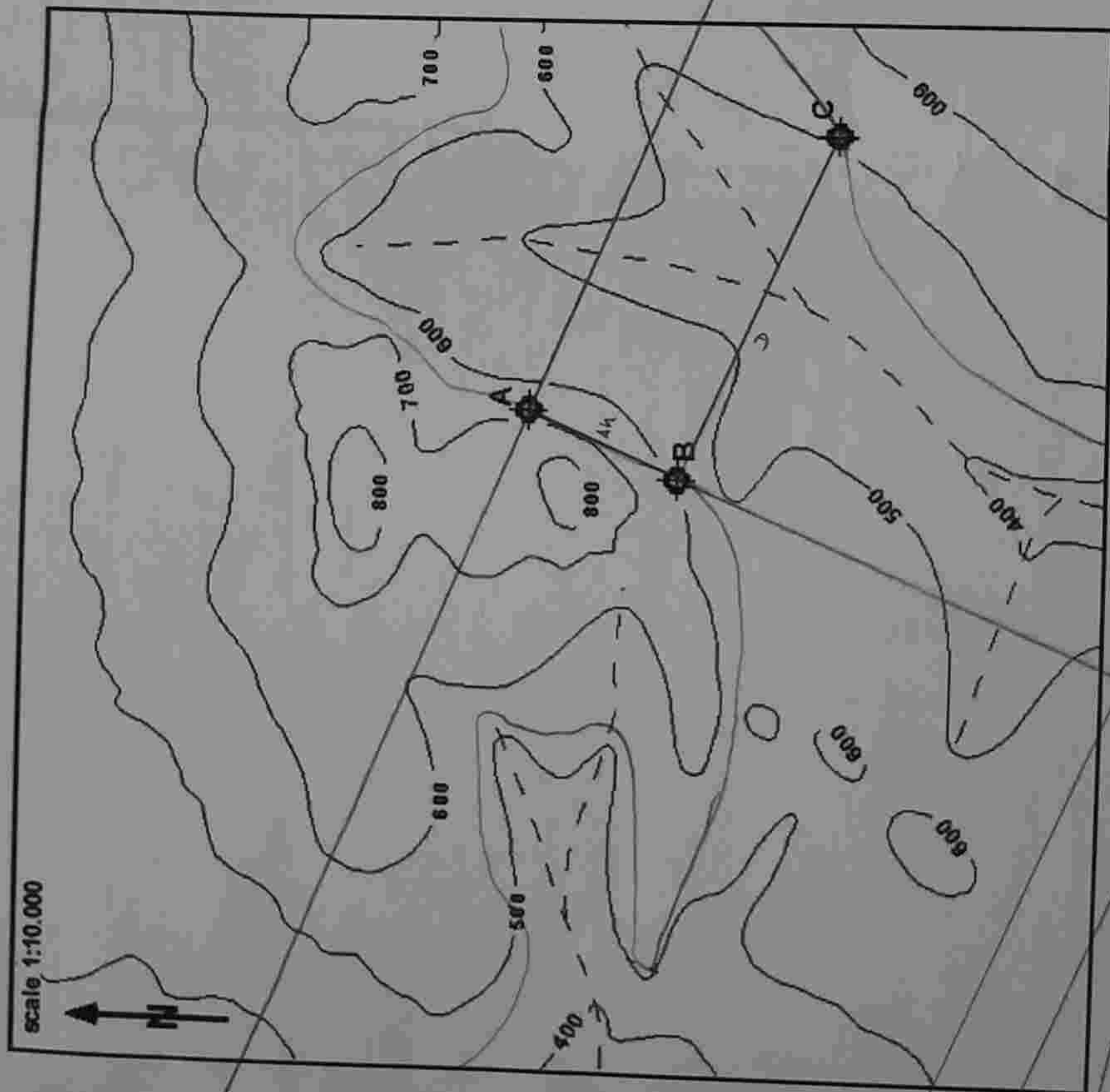
$$\Delta h = 100 \text{ m}$$

$$D = 500 \text{ m}$$

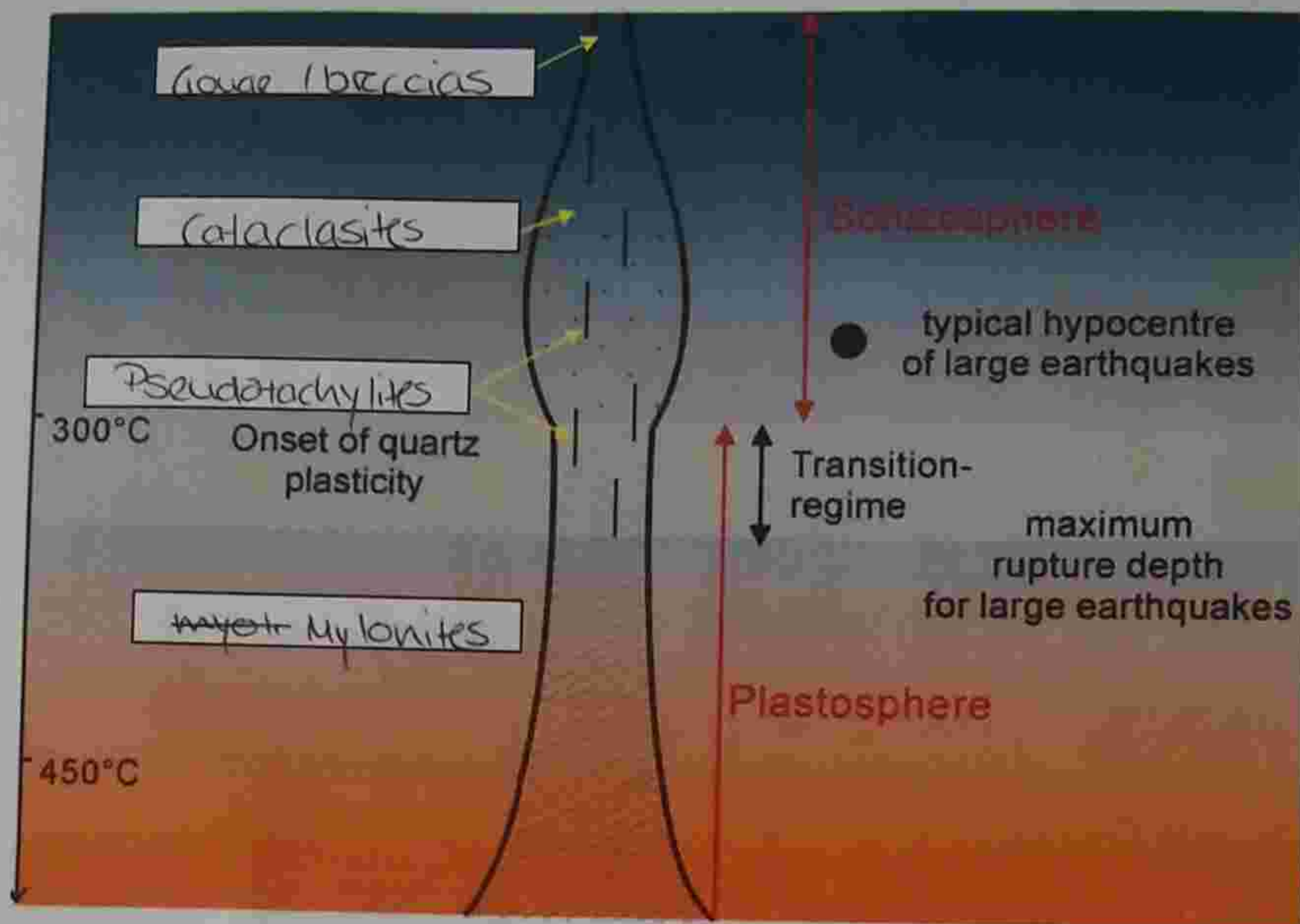
$$\tan \delta = \frac{\Delta h}{D}$$

$$\frac{100 \text{ m}}{500 \text{ m}} = 0.2 \approx 11.3^\circ$$

plane 4



Problem 4 (4 pt.)



Sibson-Scholz fault zone model: the Sibson-Scholz fault zone model relates the type of fault product to temperature/depth in the crust. Indicate on the sketch above where can be found the following structures: 1- Cataclasites, 2- Gouge/breccias, 3- Mylonites and 4- Pseudotachylites.

Problem 5 (12 pt.)

- 1) Draw section AA' (pay much attention to bedding attitudes). (7 pt.)
- 2) Write down the list of formations from the oldest to the youngest one. (5 pt.)

young
↓
old

Fm B
↓
Fm X
↓
Fm Q

