

Question 5

[20]

Calculate whether failure will take place in the sidewalls of a circular tunnel with a diameter of 4m.
The rock mass has the following properties:

Rock is quartzite with a UCS of 185 MPa.

Lab tests indicate a m_i value of 12.7

RQD of the rock mass is 75%.

Joint spacing is between 30 – 50 cm with a soft infill of 1 mm.

Joints are slightly rough and the rock mass is dry.

The rock mass is confined by a vertical stress of 62 MPa and horizontal stress of 31 MPa. *Shear*

The induced stresses due to the excavation of the circular tunnel are $3 = \sigma_h / \sigma_v$

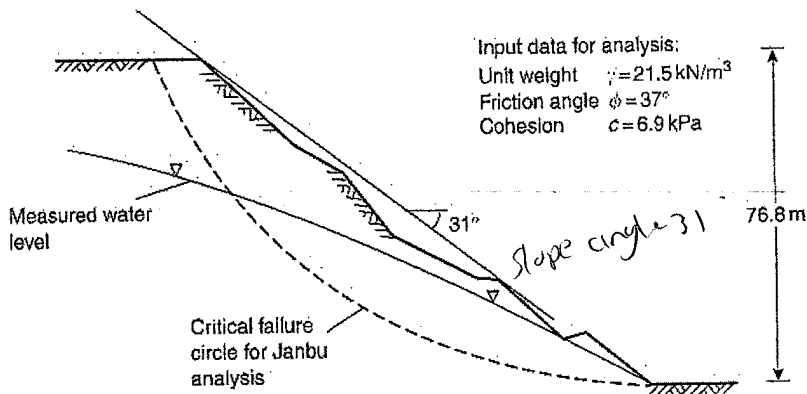
σ_h

σ_v

Question 6

[10]

Determine the factor of safety of a in heavily kaolinized granite slope with the following profile and characteristics.



4.5

Question 7

[10]

Discuss the attached stereographic projection with regards to slope stability.