

**REPUBLIC OF SOUTH AFRICA  
DEPARTMENT OF MINERALS AND ENERGY  
EXAMINATION FOR THE MINE SURVEYORS CERTIFICATE OF COMPETENCY**

DATE: 15<sup>th</sup> April 2005  
TIME: 12:30 to 15:30 (3 Hours)

TOTAL MARKS: 100  
TO PASS: 50

**SURVEY III**

- Note:**
- (1) Work to 1 second of arc and 0.001m.
  - (2) Logs and functions must be shown to six (6) decimal places.
  - (3) **All steps and checks** must be shown.
  - (4) **All calculations and answers** to be **shown clearly**.
  - (5) Sketch ~~are~~ not drawn to scale and attached herewith.
  - (6) The make and model number of your calculator **must** be written on the front cover of your answer book.
  - (7) All elevations refer to above mean sea level

**QUESTION 1**

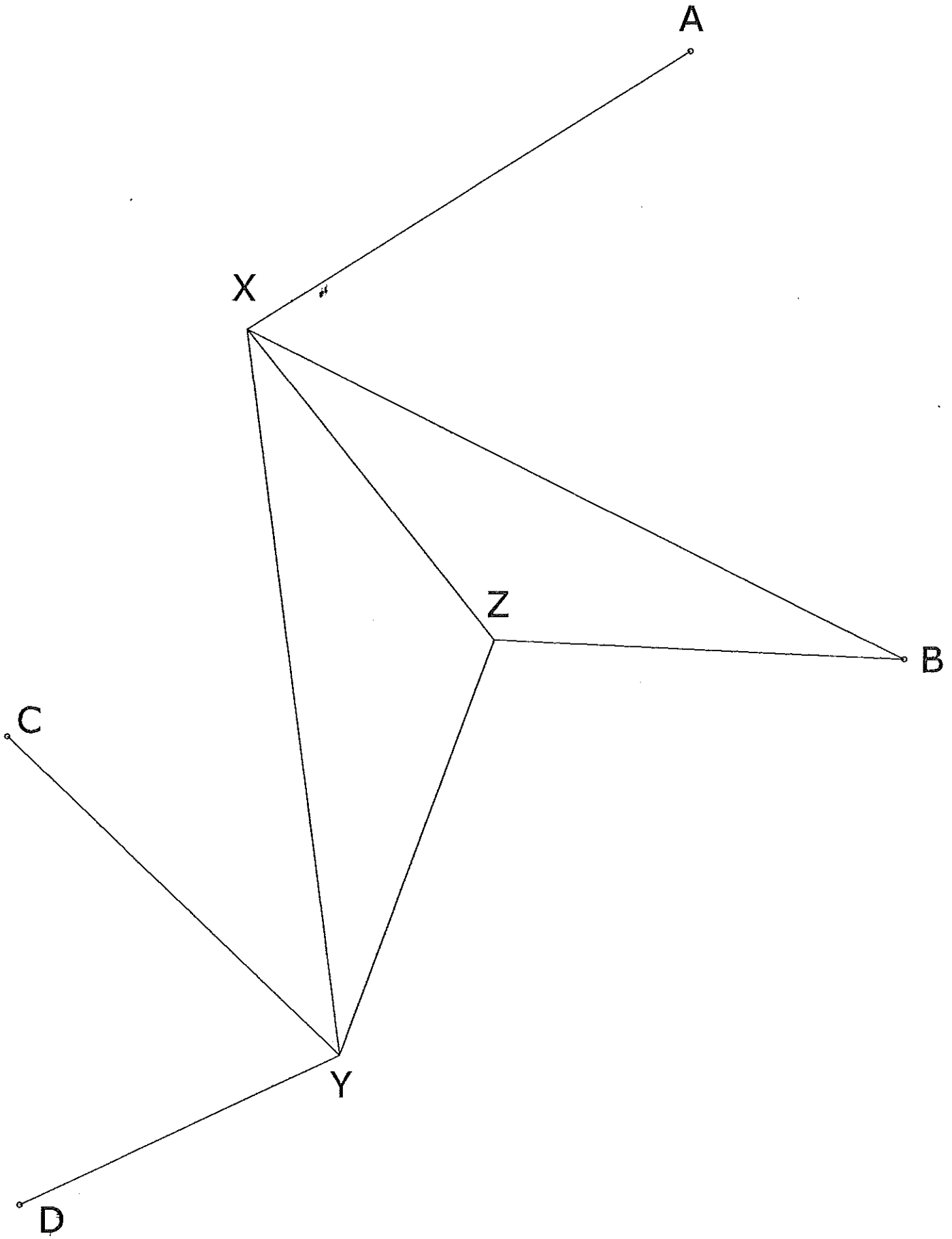
Geological diamond drill boreholes were drilled to determine the extent of a reef plane. The Mine Surveyor obtained the following information:

Co-ordinates (m)				
Point	Y	X	Elevation	Reef intersection elevation
A	239,738	-1 277,459		
B	-589,222	1 077,000		
C	2 889,750	1 369,984		
D	2 841,043	3 172,096		
X			+1 191,079	+1 169,274
Y				+1 105,797
Z				+1 000,000
Outcrop x			+1 191,079	

Reduced Field Book data	
Angle AXB	58° 40' 06"
Angle BXY	56° 03' 56"
Angle XYC	39° 01' 54"
Angle CYD	68° 23' 26"
Angle XZY	120° 47' 03"
Angle YZB	131° 26' 01"

Calculate the co-ordinates of X, Y and Z respectively, the strike direction and true dip of the intersected reef plane and the nearest outcrop position to X (Outcrop x).

[100 marks]



Sketch not to scale