

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

DATE: 16 April 2004 (Friday)
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) All steps and checks must be shown.
 - (3) Logs and functions must be shown to six (6) decimal places.
 - (4) Sketch are not drawn to scale and attached herewith.
 - (5) The make and model number of your calculator **must** be written on the front cover of your answer book.

QUESTION 1

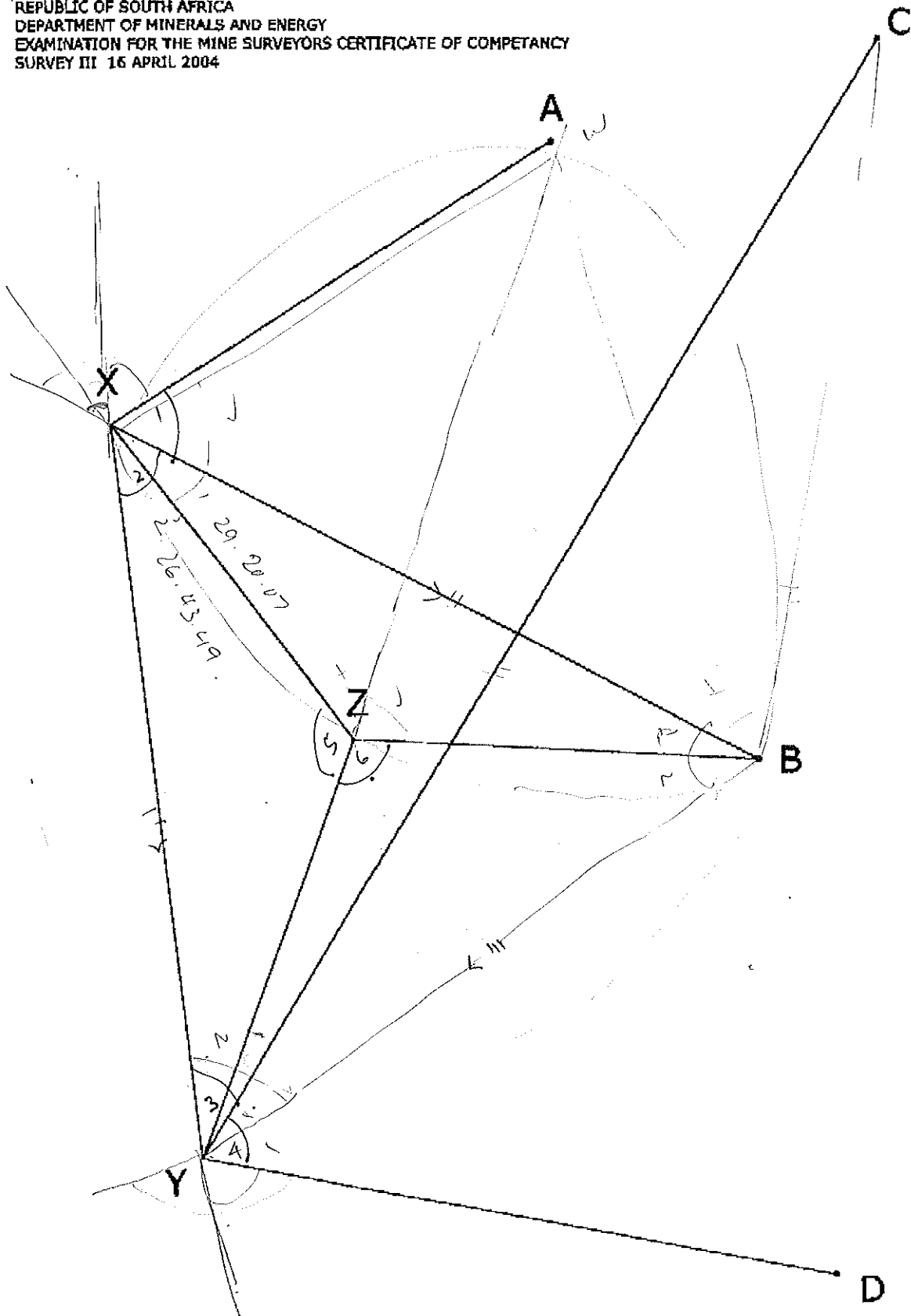
The following borehole information and survey observations are available. The boreholes were drilled to determine the outcrop position for further geological investigation.

Reduced Field Book data		
Angle AXB	58° 40' 06"	1
Angle BXY	56° 03' 56"	2
Angle XYZ	39° 01' 54"	3
Angle CYD	68° 23' 26"	4
Angle XZY	120° 47' 03"	5
Angle YZB	131° 26' 01"	6

Co-ordinates				
Point	Y	X	Elevation	Reef intersection elevation
A	-120,262	-1 877,459		
B	-949,222	477,000		
C	-1 396,875	-2 268,599		
D	-1 246,551	2 442,740		
X	1 609,003	-7 99,978	+1 600,025	+1 578,220
Y	1 289,973	2 000,035		+1 514,743
Z				+1 408,946
X outcrop			+1 600,025	

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

[100 marks]



Sketch not to scale