

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

DATE: 12 October 2007 (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) 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.

QUESTION

L,M,N and K is the boundary of a mine. It is required to alter the Northern boundary so that it is parallel to the strike of the reef, at the same time the area of the mine is to remain constant. This new boundary is shown by XY in the sketch, Y being the extension of line KN. It is required to construct a railway line from point C to K on curves FJ and JE, points EA and AK (FJE being a double curve).

With the information given on the sketch, calculate:

1. The length of the railway line from point C to K
2. The co ordinates of X and Y

[100 marks]

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DATE: 15th April 2005
TIME: 12:30 to 15:30 (3 Hours)

TOTAL MARKS: 100
TO PASS: 50

SURVEY III

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 - (3) All steps and checks must be shown.
 - (4) All calculations and answers to be shown clearly.
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 - (7) All elevations refer to above mean sea level

QUESTION 1

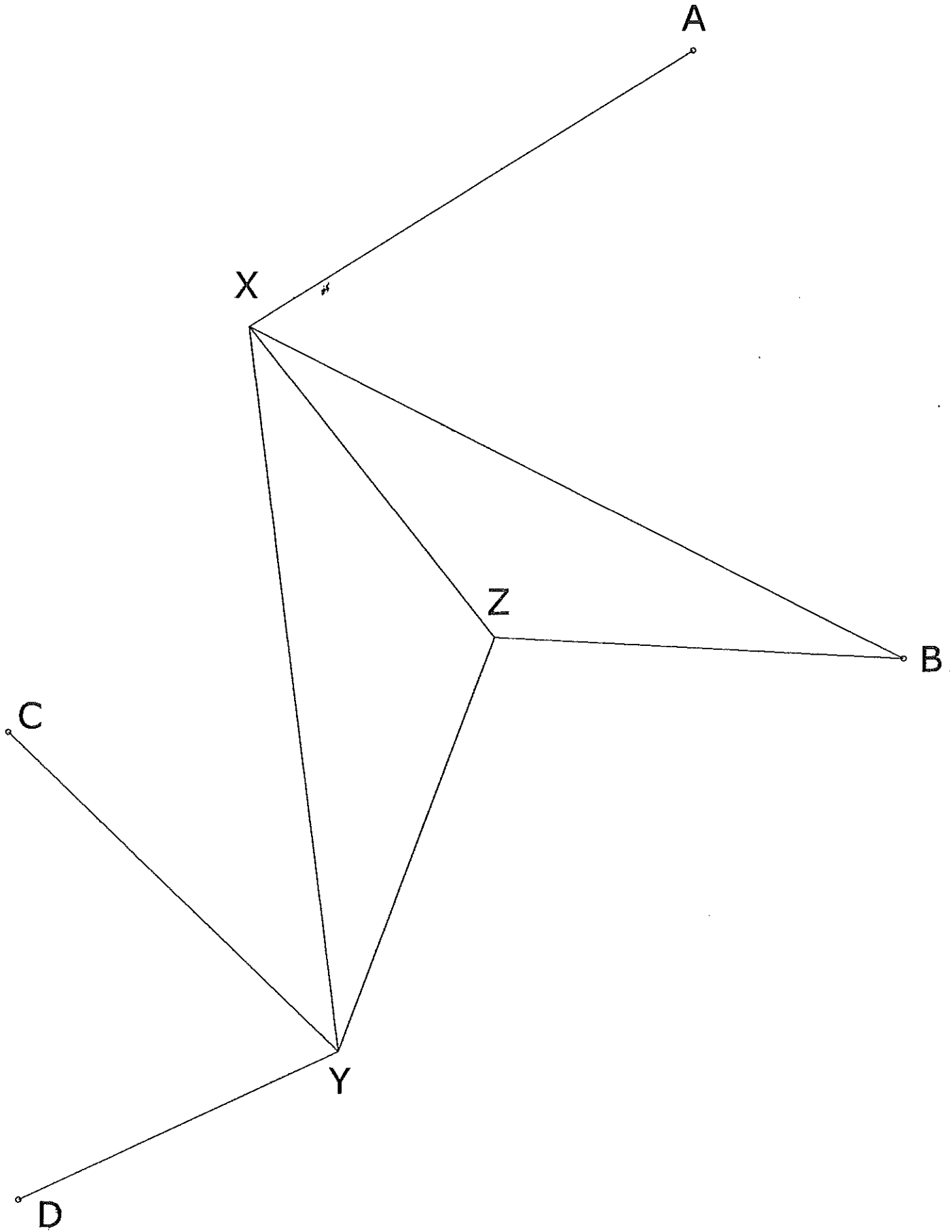
Geological diamond drill boreholes were drilled to determine the extent of a reef plane. The Mine Surveyor obtained the following information:

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 XYZ	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

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QUESTION 1

B and C are points surveyed on the outcrop of a quarry. At point C a fault is mapped dipping in a Southerly direction. D is a point on the intersection of the footwall and the highwall of the quarry. A is a point on the intersection of the surface and the highwall of the quarry.

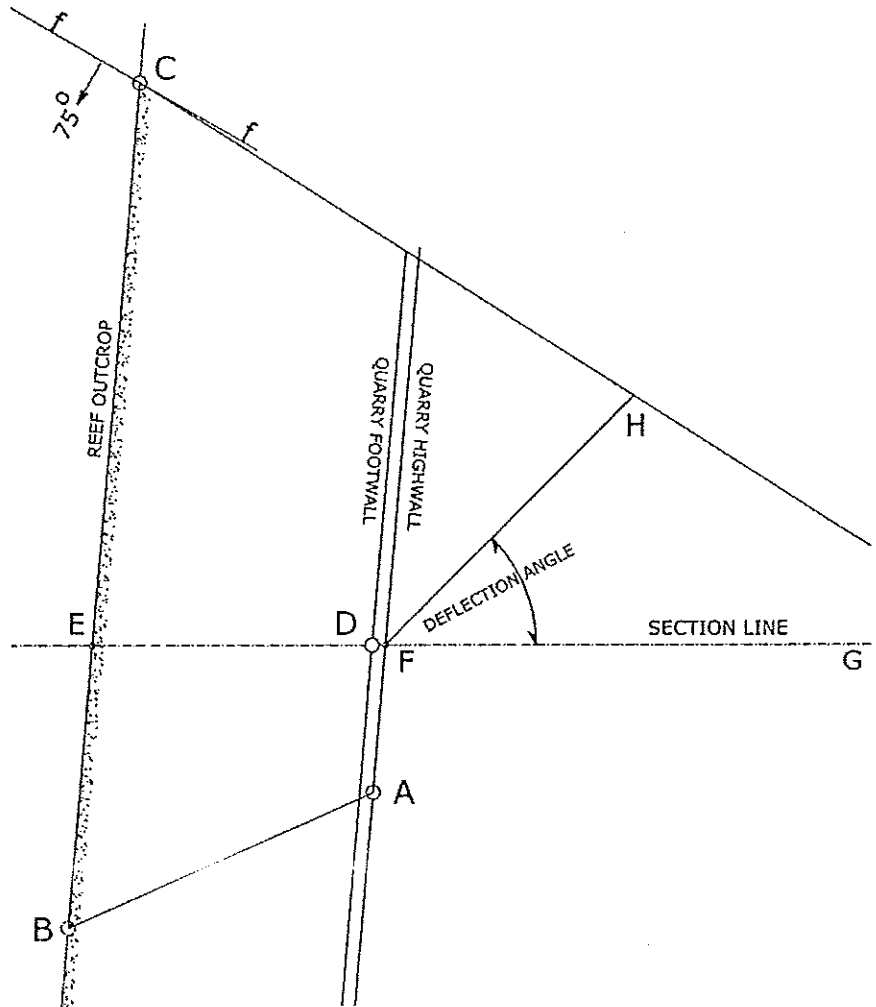
Co-ordinates			
Point	Y	X	Elevation
A	- 682,955	+ 172,614	+ 1 798,694
B	+ 1 728,998	+ 634,517	+ 1 849,726
C	+ 1 477,029	- 2 245,484	+ 1 805,298
D	+ 685,007	- 325,484	+ 1 665,641
True dip direction of diagonal fault at C			30° 00' 00"
True dip of the diagonal fault at C			75° 00' 00"
Deflection angle			45° 00' 00"

Assume the reef and surface planes are even and evenly dipping.
Assume the highwall height has been maintained throughout the area shown.
Section line EDFG is a straight line on the true dip of the reef.
CH is the line of intersection between the reef and the diagonal fault.

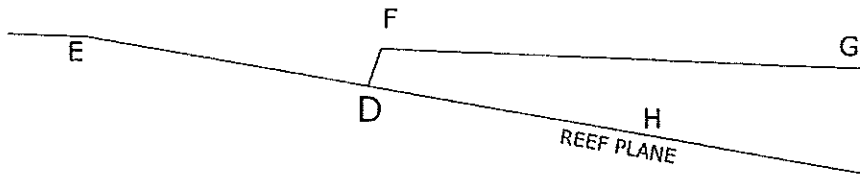
- a) Calculate the co-ordinates and elevations of E and F on the section EDFG along the direction of true dip, intersecting the outcrop and highwall respectively.
- b) Calculate the co-ordinates and elevation of point H at the reef intersection with the diagonal fault.
- c) Calculate area ABECHFA in hectares.

[100 marks]

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PLAN



SECTION EG

SURVEY III 2006 October