

**REPUBLIC OF SOUTH AFRICA
DEPARTMENT OF MINERAL RESOURCES
EXAMINATION FOR THE MINE SURVEYORS CERTIFICATE OF COMPETENCY**

DATE: **15 April 2011**
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) Trigonometrical 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) Sketches have been reduced and are not 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.

A reserve area is represented by points A, B, C and D as indicated on the attached plan. For the purpose of a public road and railway line it is required to cut off an area of 30 785 774,2m² represented by points A, B, F and BH1 so that line F,BH1 is parallel to AB.

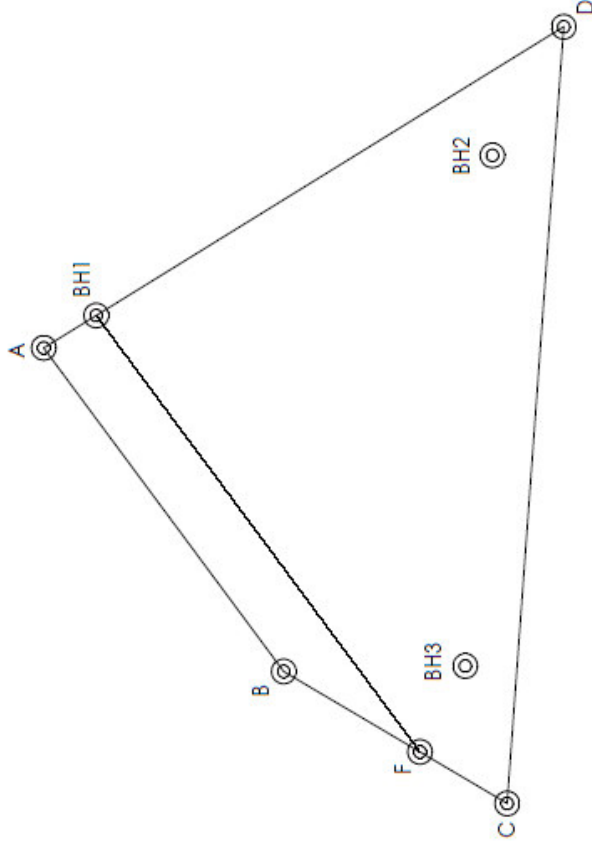
From the following information calculate:

1. Co ordinates of points BH1 and F.
2. The inclined area F, BH1, D, and C to the nearest m².
3. Strike of the reef.

| | | |
|------------------------|-----------------|------------------|
| Co ordinates of Trig 1 | Y= -75 876,289 | X= 2 794 767,734 |
| Co ordinates of Trig 2 | Y= -94 027,550 | X= 2 795 249,017 |
| Co ordinates of Trig 3 | Y= -84 059,405 | X= 2 797 577,178 |
| Co ordinates of BH 2 | Y= -90 486,679 | X= 2 815 061,852 |
| Co ordinates of BH 3 | Y= -73 893,860 | X= 2 814 175,679 |
| Angle | Trig 1 A Trig 2 | 117:59:39 |
| Angle | Trig 3 A Trig 2 | 065:33:35 |
| Angle | Trig 1 A Trig 3 | 052:26:04 |
| Angle | DAB | 84:56:33 |
| Angle | ABC | 157:09:47 |
| Angle | BCD | 63:40:48 |
| Angle | CDA | 54:12:52 |
| Angle | Trig1 A B | 70:47:40 |
| Collar Elevation | BH1 | 1 653,494m |
| Collar Elevation | BH2 | 1 600,530m |
| Collar Elevation | BH3 | 1 620,431m |
| Vertical depth to reef | BH1 | 120,5m |
| Vertical depth to reef | BH2 | 200,4m |
| Vertical depth to reef | BH3 | 153,8m |
| Horizontal Distance | AB | 13 106,760m |
| Horizontal Distance | BC | 8 454,740m |
| Horizontal Distance | CD | 25 305,540m |
| Horizontal Distance | DA | 19 908,428m |

[100 marks]

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PLAN - NOT TO SCALE

