

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

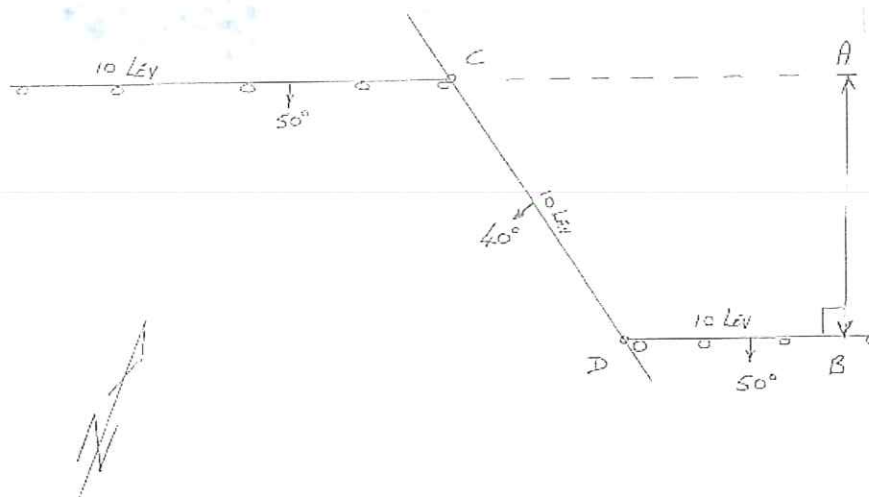
DATE: 16 October 2009 (Friday)  
TIME: 08:30 to 11:30 (3 Hours)

TOTAL MARKS: 100  
TO PASS: 50

SURVEY II

- 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) Sketches are not drawn to scale.
  - (5) All sketch constructions MUST be shown
  - (6) The make and model number of your calculator must be written on the front cover of your answer book.

QUESTION 1



The plan shows two reef strike lines on the tenth level of a mine. A fault has dislocated the reef as shown on the plan.

The reef is known to strike in a direction of  $250^{\circ}30'00''$  and dips at  $50^{\circ}$  in a southerly direction.

The fault is known to strike in a direction of  $165^{\circ}45'00''$  and dips at  $40^{\circ}$  in a westerly direction.

The direction of movement on the fault plane is  $278^{\circ}00'00''$

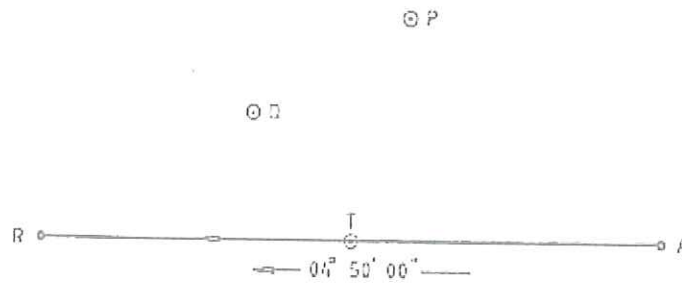
The true amount of movement on the fault is 35,0m.

Calculate:

1. The direction of the reef / fault line of intersection.
2. The dip along the reef / fault line of intersection.
3. The horizontal displacement [A] to [B] as shown on the plan.

[20 marks]

**QUESTION 2**



From the straight line of a track AR, it is required to lay out a curve which shall,

- a) Pass through the two points P and Q
- b) Have the straight line AR as tangent.

Given Co-ords :	A	+ 15,000	Y	-1 350,000	X
	P	+948,000		- 853,000	
	Q	+512,000		- 452,000	

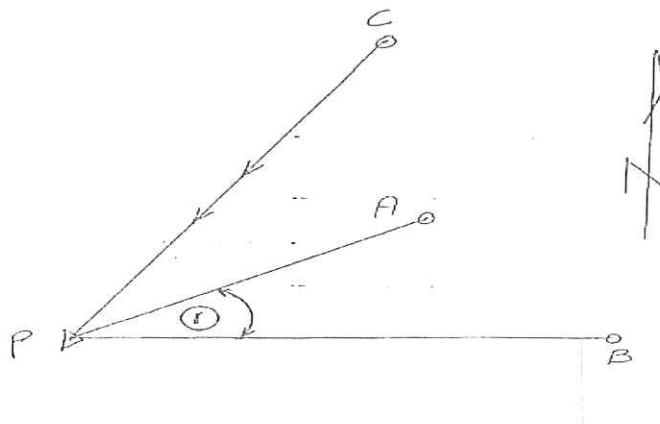
Direction AR =  $04^{\circ}50'00''$

Calculate:

- 1. The co-ordinates of point T on straight line AR
- 2. The radius of the curve.

[30 marks]

**QUESTION 3**



In order to calculate the co-ordinates of an unknown point [P]. The following information is available.

Given:

Horizontal clockwise angle APB =  $25^{\circ}09'50''$

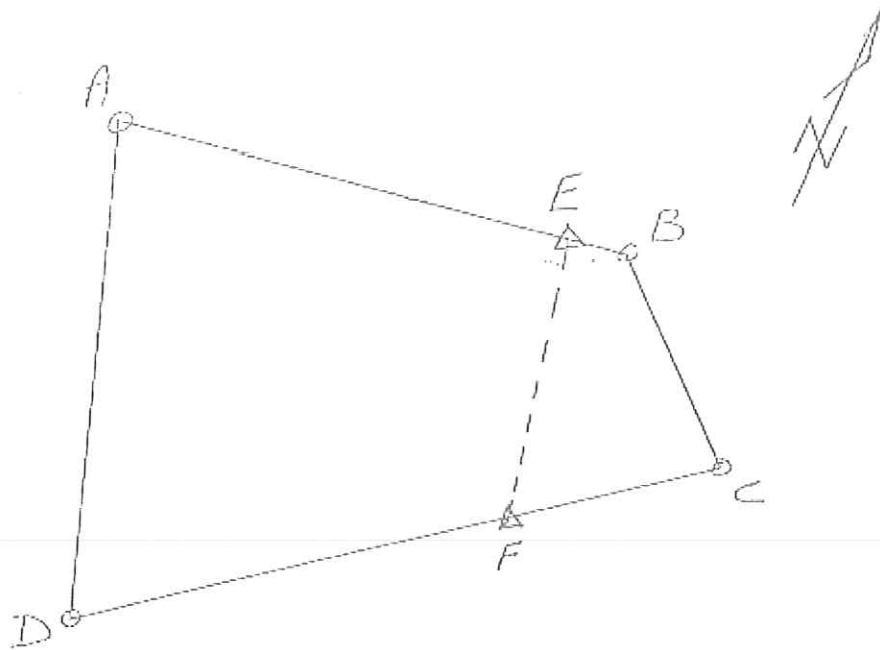
The direction from [C] to [P] =  $24^{\circ}32'04''$

	Y	X
Co-ordinates of point [A]	-7 459,925	+8 039,770
Co-ordinates of point [B]	-7 919,807	+9 400,679
Co-ordinates of point [C]	-6 862,734	+4 516,853

Calculate the co-ordinates of point [P]

[25 marks]

**QUESTION 4**



Area ABCD is a portion of a farm from which an area BCFE = 1 hectare is to be sold. A condition of the sale is that the division line EF must be shortest possible distance. Point [E] must lie on line AB and point [F] must lie on line DC.

Given:

The direction from [A] to [B] =  $268^{\circ}10'10''$

The direction from [C] to [D] =  $69^{\circ}46'00''$

	Y	X
Co-ordinates of point [B]	+ 2 833,677	-7 910,578
Co-ordinates of point [C]	+ 2 803,639	-7 857,844

Calculate the co-ordinates of points [E] and [F].

[25 marks]

**Total [100 marks]**