

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

DATE: 10 OCTOBER 2008

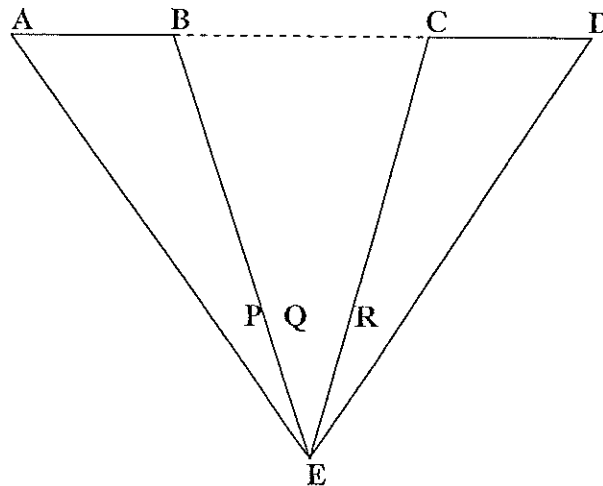
TOTAL: 100

TIME: 08h30 to 11h30

TO PASS: 50

SURVEY II

QUESTION 1



AB and CD are two portions of a base line separated by the portion BC that cannot be directly measured. An instrument is set up at E, and readings are taken to A, B, C and D. (A, B, C and D are on a straight line)

Given:

Distance AB = x

Distance CD = y

Angle AEB = P

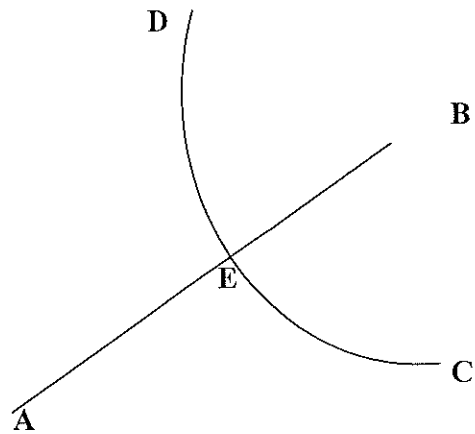
Angle BEC = Q

Angle CED = R

Derive a formula for calculating distance BC

(10)

QUESTION 2



Sketch not to scale

CD is a curvilinear railway boundary intersected by the farm boundary AB at point E. The radius of the curve is 130 metres.

Given: Co-ordinates

	Y	X
A	+164,636	+56,441
B	-69,326	-17,438
C	+15,615	+90,731
D	+117,735	-105,413

Calculate the co-ordinates of E

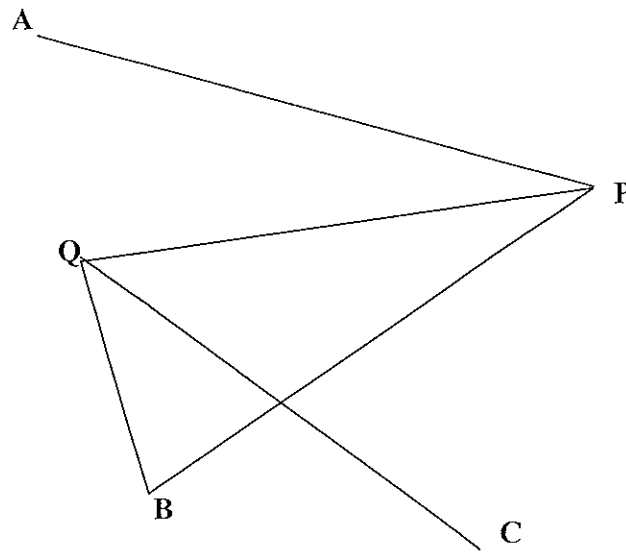
(22)

QUESTION 3

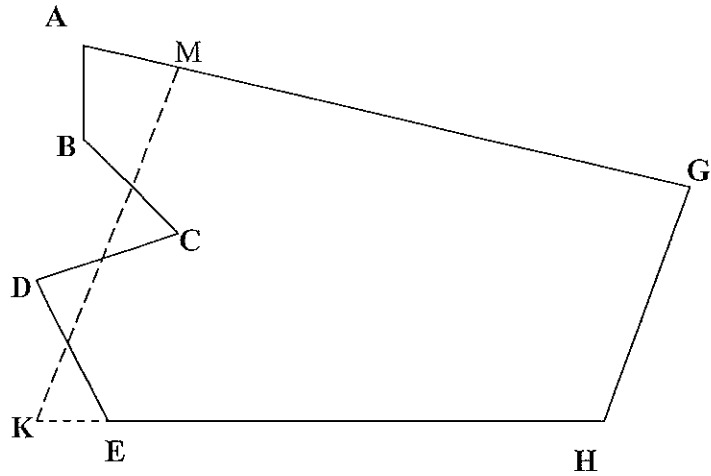
Use the following information to calculate the coordinates of points P and Q

Co-ordinates	Y	X
A +	151,980	+ 13 875,906
B +	868,846	+ 17 692,924
C -	4 125,800	+ 20 465,586

Angles	
QPA =	47° 14' 37"
BPQ =	14° 01' 08"
PQB =	88° 33' 26"
PQC =	36° 41' 00"



Question 4



Sketch not to scale

It is required to reposition a mine boundary ABCDE by means of a fence MK, parallel to the boundary HG maintaining the same area as ABCDEHG.

Given:

	Y	X
A	$\pm 0,000$	$\pm 0,000$
B	-123,390	+ 31,410
C	-171,140	- 38,860
D	-250,600	- 25,320
E	-352,610	-116,700

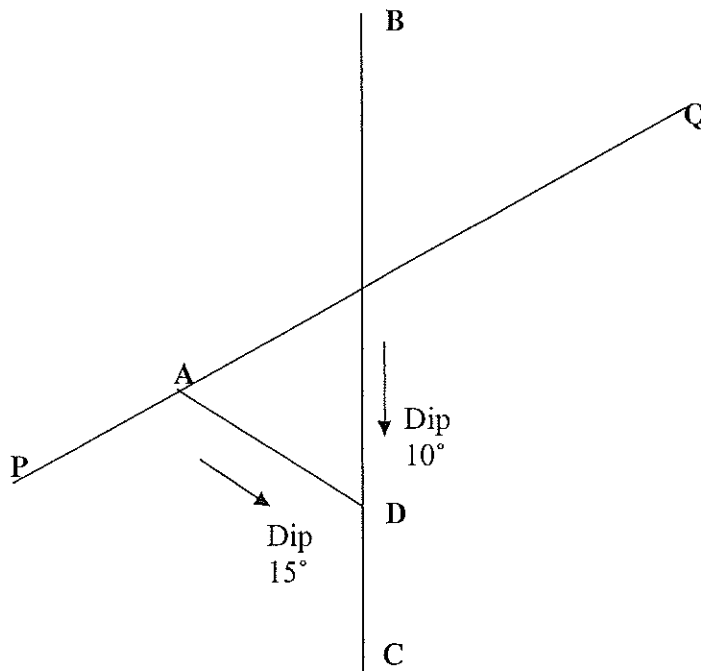
Direction	A to G = $180^{\circ} 00' 00''$
	E to H = $151^{\circ} 55' 20''$
	G to H = $273^{\circ} 52' 40''$

Calculate the co ordinates of K and M, which are the terminal points of the adjusted boundary.

(30)

QUESTION 5

A cross raise PAQ to a sand filling borehole passes through a faulted reef plane at A and a sand launder dipping at 10° on this plane has been installed on the line BC. Launder AD dipping at 15° on the same reef plane is to connect point A (along the shortest distance on reef) with the launder BC at D. Point A and B are on the same elevation.



Given coordinates

	Y	X
A	+2 616,320	+4 454,280
B	+2 664,800	+4 430,360
C	+2 563,460	+4 428,240

Calculate:

- The direction of true dip of the reef
- The direction of launder AD
- The true length of the launder AD

(10)

[100]