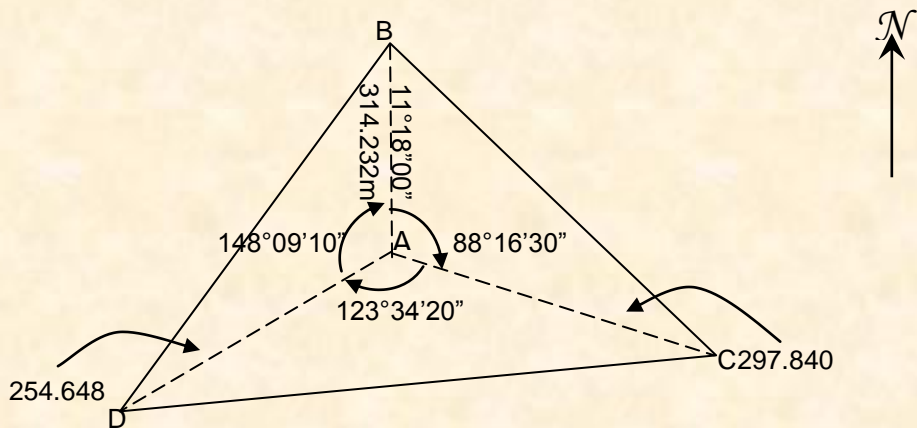


MATHEMATICS ANSWERS

Level Three

Geometry 4



- a) $AB = 11^{\circ}18'00''$ (given)
 $AC = 11^{\circ}18'00'' + 88^{\circ}16'30'' = 99^{\circ}34'30''$
 $AD = 99^{\circ}34'30'' + 123^{\circ}34'20'' = 223^{\circ}08'50''$
- b) Let A equal an 1000.00N and 1000.00E
 Compute the change in Northings and Eastings from A to each radiation.

$$\begin{aligned} \text{To B: } \Delta N &= 308.14\text{m} \\ \Delta E &= 61.57\text{m} \end{aligned}$$

$$\Rightarrow B = 1308.14\text{mN}, 1061.57\text{mE}$$

$$\begin{aligned} \text{To C} \quad \Delta N &= -49.54\text{m} \\ \Delta E &= 293.69\text{m} \end{aligned}$$

$$\Rightarrow C = 950.46\text{mN}, 1293.69\text{mE}$$

$$\begin{aligned} \text{To D} \quad \Delta N &= -185.79\text{m} \\ \Delta E &= -174.15\text{m} \end{aligned}$$

$$\Rightarrow D = 814.21\text{mN}, 825.85\text{mE}$$

c) Compute the bearing and distance to each mark by using polar to rectangular methods

Line BC	=	426.40m	bearing	147°01'05"
Line CD	=	487.28m	bearing	253°45'46"
Line DB	=	547.29m	bearing	25°30'43"

d) A partial check on result can be obtained by adding the internal angles of the three triangles.

ΔBAC	ΔBAD
44°17'00"	148°09'10"
+47°26'30"	+15°53'17"
+88°16'30"	+15°57'33"
<u>180°00'00"</u> ✓	<u>180°00'00"</u> ✓

ΔACD
125°45'38"
+25°34'20"
+30°40'02"
<u>180°00'00"</u> ✓

May also choose to use sine and cosine rules