Convert decimal degrees 156.742° to degrees minutes seconds.

The whole number 156 is degrees. 156°.

Multiply the remaining decimal by 60.

0.742×60 = 44.52,

The whole number 44 is minutes. 44’

Multiply the remaining decimal by 60.

0.52×60 = 31.2 31.2”

DMS format 156° 44’ 31.2”

■■■■

Convert 30° 15’ 50” angle to decimal degrees

Decimal Degrees = degrees + (minutes/60) + (seconds/3600)

= 30 + (15/60) + (50/3600) = 30.263888889°

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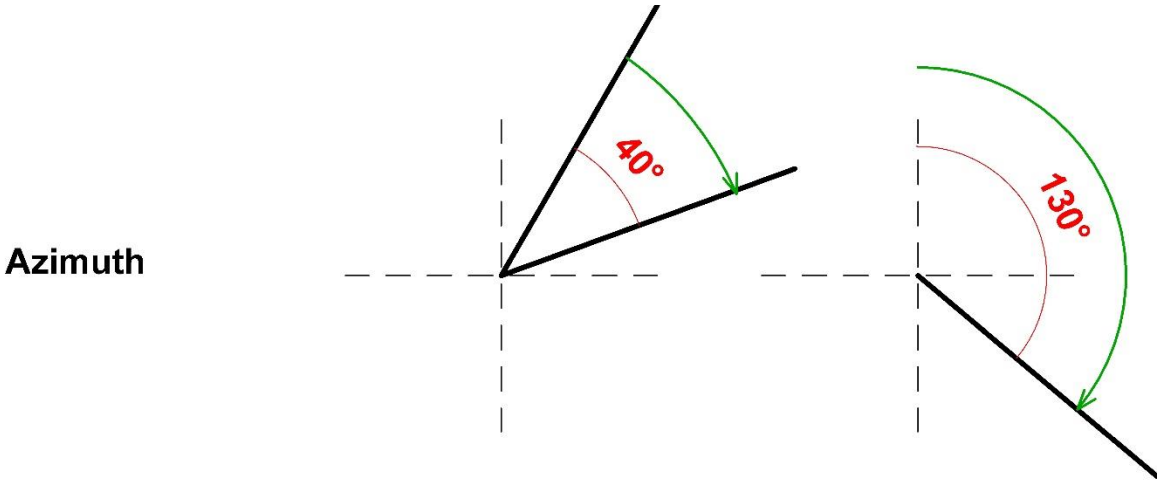
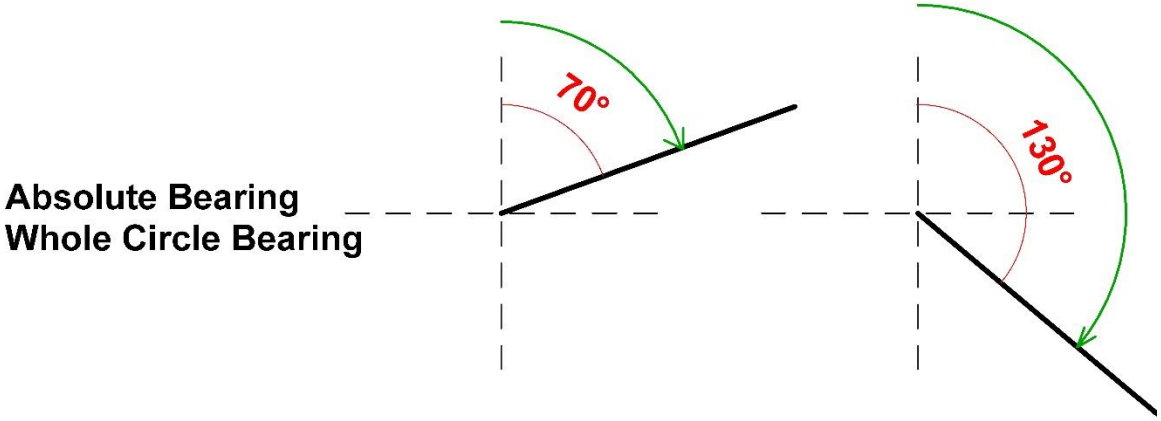
If a piece of land has five sides. What is the sum of its interior angles?

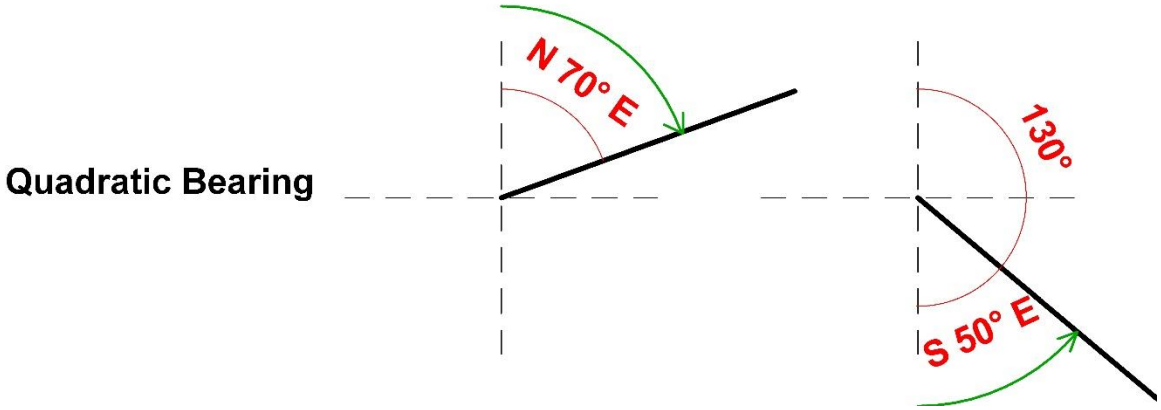
Total angles = (N - 2) × 180°

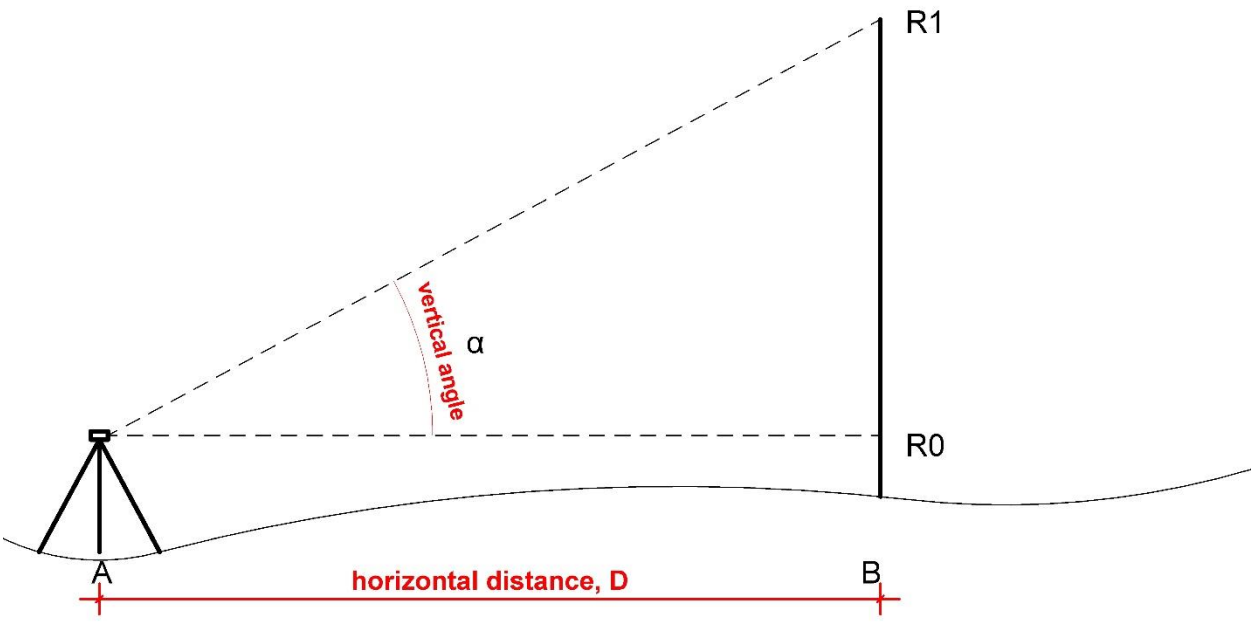
= (5 – 2) × 180° = 540°

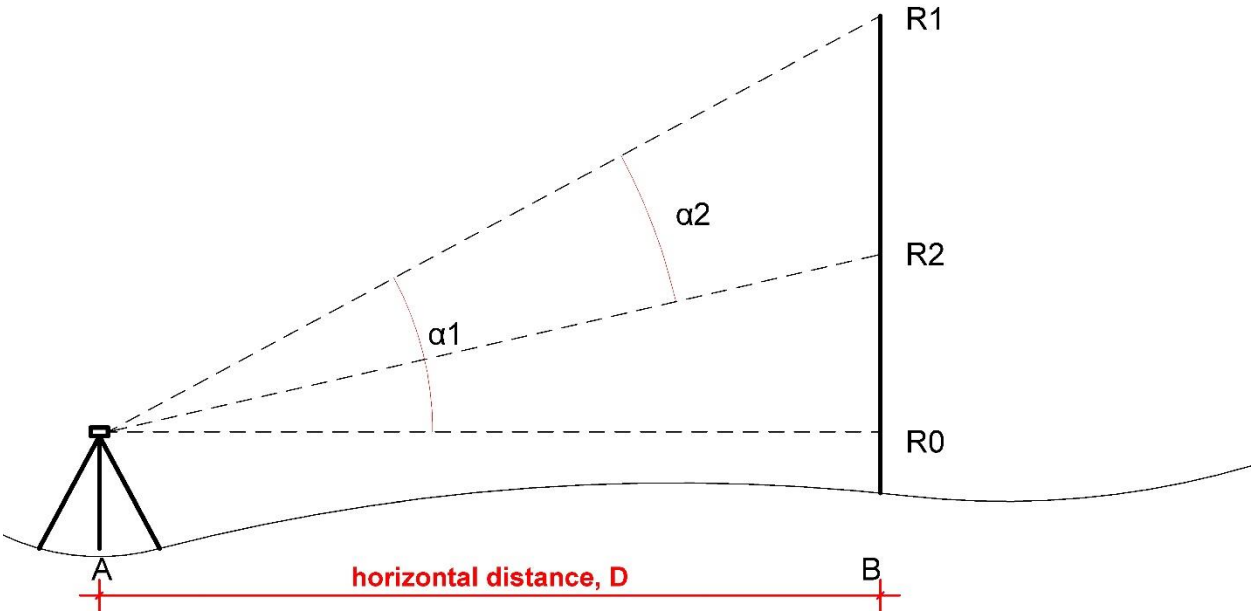
■■■■


Azimuth
40°
130°


Absolute Bearing
Whole Circle Bearing
70°
130°

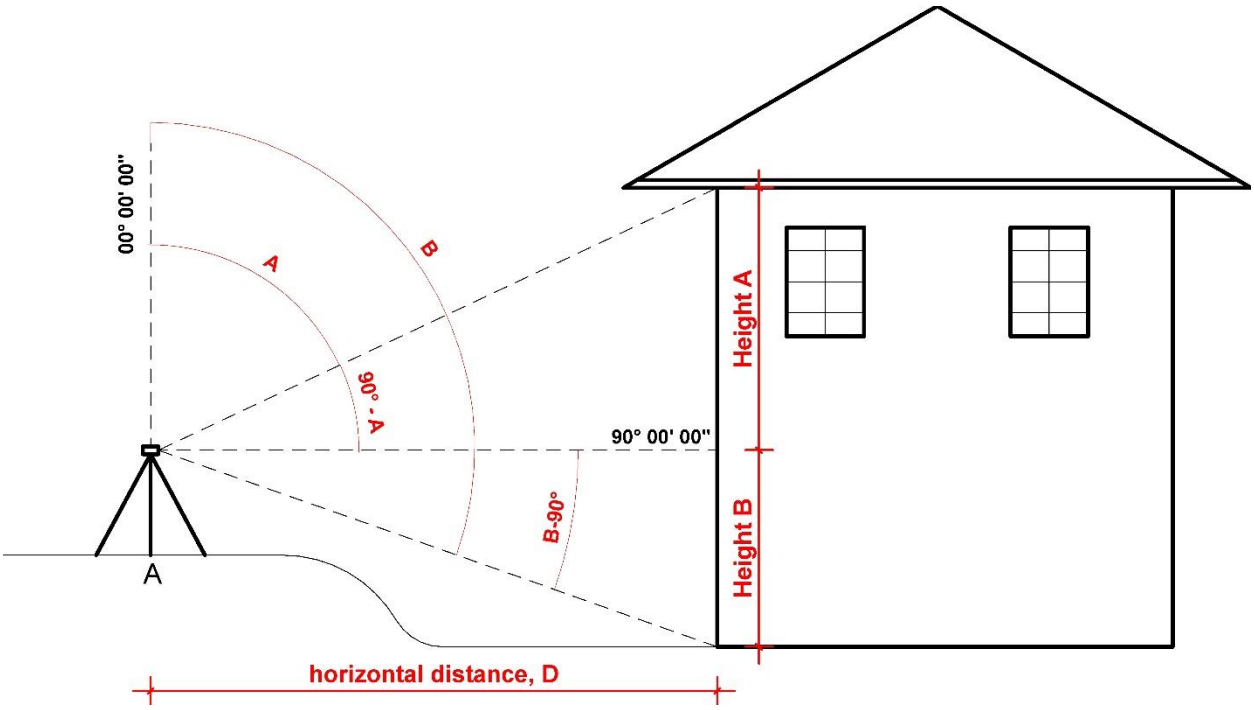

Quadratic Bearing
N 70° E
130°
S 50° E





$$AB = D = (R_1 - R_0) / \tan \alpha$$

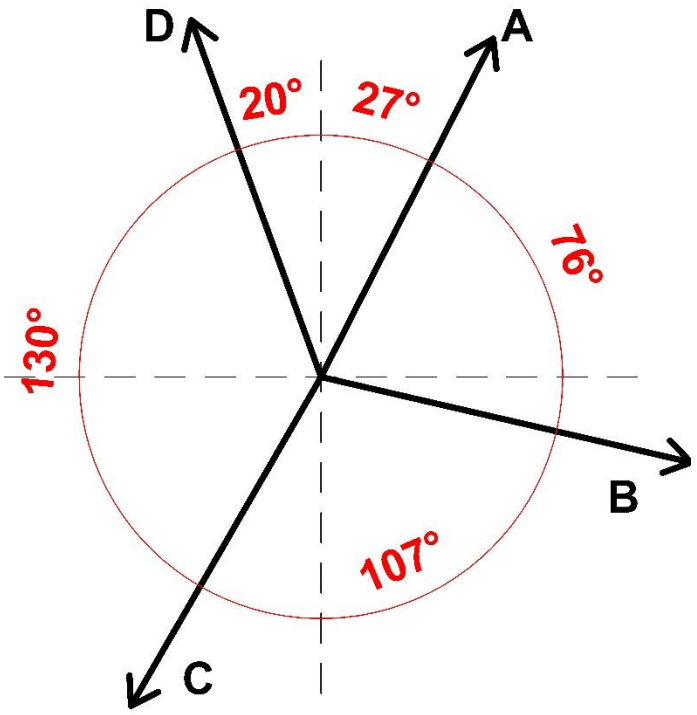
$$AB = D = (R_1 - R_2) / (\tan \alpha_1 - \tan \alpha_2)$$



Height A = horizontal distance × tan (90°– A°)

Height B = horizontal distance × tan (B°– 90°)

Determine the WCB and QB for the vectors in the following sketch.

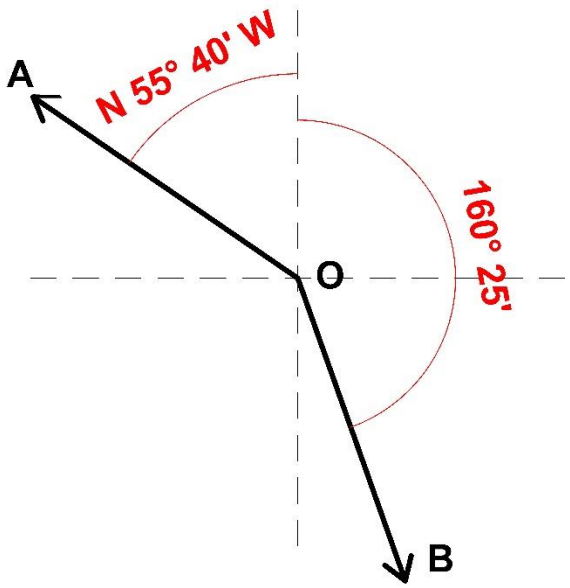


A:	WCB:	27°
	QB:	N 27° E
B:	WCB:	103°
	QB:	S 107° E
C:	WCB:	210°
	QB:	S 17° W
D:	WCB:	340°
	QB:	N 20° W

■■■■

Given: WCB of line OB = 160° 25' and QB of line OA = N 55° 40' W

Calculate: 1- QB of line OB. 2- WCB of line OA. 3- Horizontal angle AOB.



1- QB of line OB:	S 19° 35’ E	
2- WCB of line OA:	304° 20’	
3- Horizontal angle AOB:	Starting from OA clockwise:	216° 5’
	Starting from OA counterclockwise:	143° 55’

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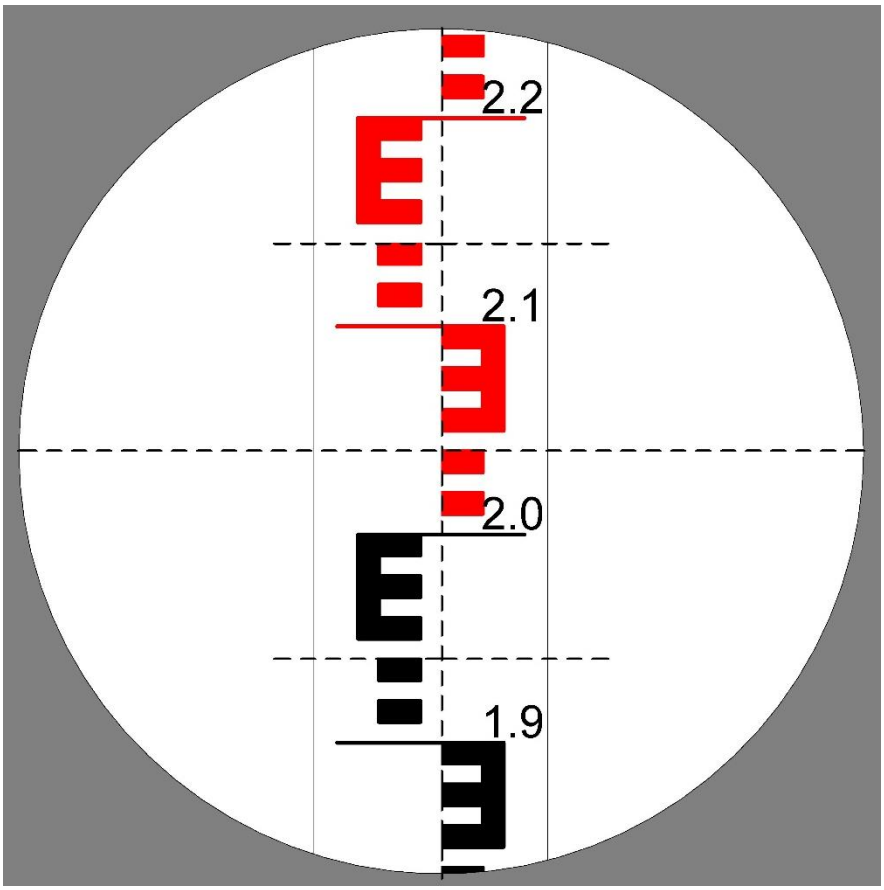
What is the horizontal distance between the level station and the staff if you see the following view in the eye piece?



Upper stadia hair reading: 2.14 m.

Lower stadia hair reading: 1.94 m.

Stadia interval = 2.14 m – 1.94 m = 0.2 m

Stadia factor = 100; constant

Distance AB = 0.2 m × 100 = 20 m.

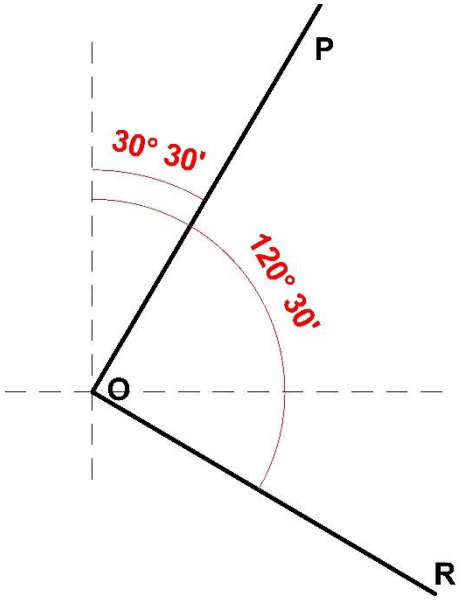
■■■■

A theodolite was temporary adjusted at station Q. The graduated staff was held vertically at station P followed by station R. Staff readings, vertical angles and horizontal circle readings were recorded at station Q as below: (height of theodolite=1.45m)

Staff Station	*Staff reading (m)*	*Vertical Angle*	*Horizontal circle*
P	*1.10*	*1°*	*30° 30'*
	2.90	*2°*	
R	*1.20*	*2°*	*120° 30'*
	2.80	*3°*	

Compute:

1- Horizontal ground distance QP. *2- Horizontal ground distance QR.*
3- Horizontal angle PQR. *4- Horizontal ground distance PR.*
5- Difference in level between P and R.



1- Horizontal ground distance QP

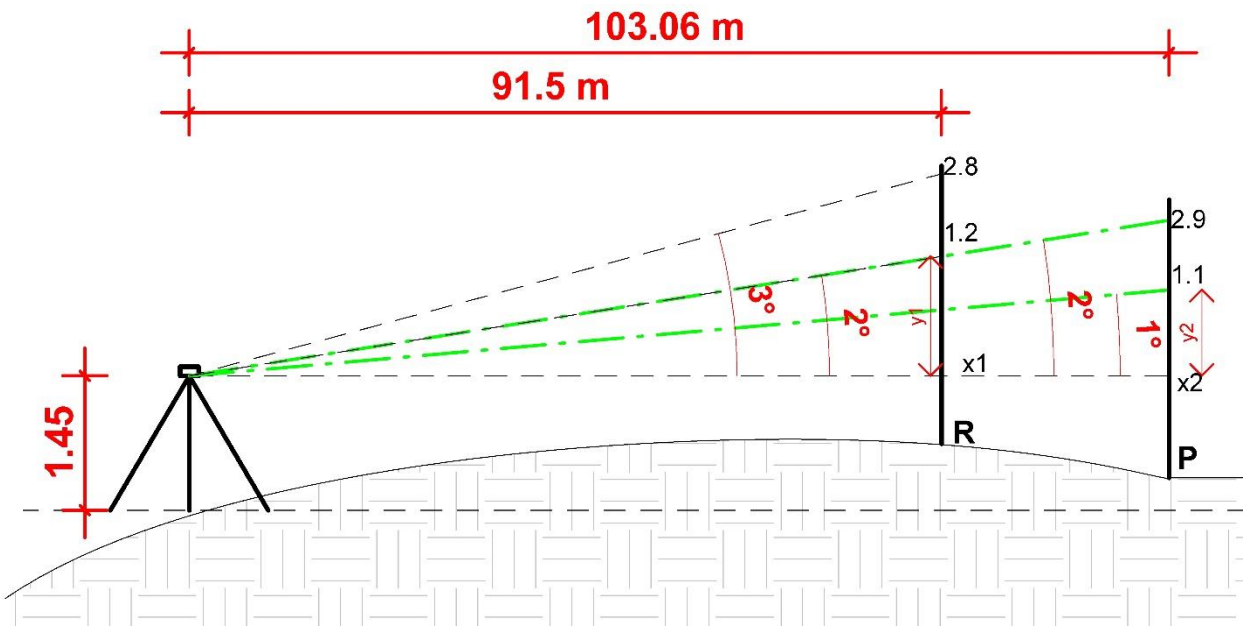
D = $(R_1 - R_2) / (\tan \alpha_1 - \tan \alpha_2)$ = (1.1 – 2.9)/tan1° – tan2° = 103.06 m

2- Horizontal ground distance QR

D = $(R_1 - R_2) / (\tan \alpha_1 - \tan \alpha_2)$ = (1.2 – 2.8)/tan2° – tan3° = 91.5 m

3- Horizontal angle PQR = 120° 30' – 30° 30' = 90°

4- Horizontal ground distance PR = $\sqrt{103.06^2 + 91.5^2} = 92.43m$



5- Difference in level between P and R.

y1 = 91.5 × tan2° = 3.195 m

➔ staff reading at horizontal line x1 = 1.2 – 3.195 = – 1.995 m

y2 = 103.06 × tan1° = 1.799 m

➔ staff reading at horizontal line x2 = 1.1 – 1.799 = – 0.699 m

Difference between reading equals difference in levels = – 1.995 – (– 0.699) = – 1.296 m

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