

PAPER II.

1.—In compass surveys how do you ascertain the angle of deflection of two courses meeting at any point.

Case 1—When the first letters are alike, and the last letters also alike.

Case 2—When the first letters are alike, and the last different.

Case 3—When the first letters are different, and the last alike.

Case 4—When both the first and the last letters are different.

2.—Describe the Box Sextant, and the manner of using it.

3.—Supposing two points on the earth's surface to have the same latitudes but different longitudes, write down the equation by which the horizontal angle made by their respective meridians, is found.

4.—Wishing to know the distance between two points A and B accessible at both ends of the line, I measured $AC=734$ and $BC=840$ also the angle $ACB=55^\circ 40'$. What is the distance between A and B?

5.—Assuming the sectional areas of a railway cutting to be 500 and 875 feet respectively, and the distances between them 100 feet, work out the number of cubic yards by means of the Prismoidal Formula.

6.—Write down the formula for measuring heights by means of the Aneroid Barometer.

7.—Protract the following field notes on a scale of 4 chains to an inch, and compute the area :—

(1)	N. 15° E.	20	chains.
(2)	N. $37^\circ 30'$ E.	10	"
(3)	East	7	" 50 links.
(4)	S. 11° E.	12	" 50 "
(5)	South	13	" 50 "
(6)	West	10	"
(7)	S. $36^\circ 30'$ W.	10	"
(8)	N. $38^\circ 15'$ W.	8	" 50 "

8.—Assuming a railway gradient to have a difference in level of 26' 9" in a distance of 4,500 feet, what will be the rise per mile?

9.—Calculate the acreage of a rectangular field, the dimensions of which are 975 and 650 feet.

10.—A line was measured 100 feet from the base of a steeple, and the angle of elevation found to be $47^\circ 30'$; what is the height, the theodolite being 5 feet above the ground?

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