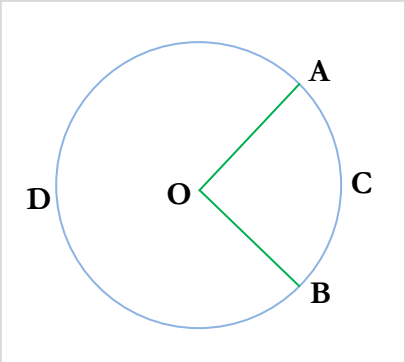
1433 – Minimum Arc Distance

You all probably know how to calculate the distance between two points in two dimensional cartesian plane. But in this problem you have to find the minimum arc distance between two points and they are on a circle centered at another point.

You will be given the co-ordinates of the points **A** and **B** and co-ordinate of the center **O**. You just have to calculate the minimum arc distance between **A** and **B**. In the picture, you have to calculate the length of arc **ACB**. You can assume that **A** and **B** will always be on the circle centered at **O**.



Input

Input starts with an integer **T (≤ 100)**, denoting the number of test cases.

Each case starts with a line containing six integers $\mathbf{O_x}$, $\mathbf{O_y}$, $\mathbf{A_x}$, $\mathbf{A_y}$, $\mathbf{B_x}$, $\mathbf{B_y}$ where $\mathbf{(O_x, O_y)}$ indicates the co-ordinate of **O**, $\mathbf{(A_x, A_y)}$ denote the co-ordinate of **A** and $\mathbf{(B_x, B_y)}$ denote the co-ordinate of **B**. All the integers will lie in the range **[1, 10000]**.

Output

For each case, print the case number and the minimum arc distance. Errors less than $\mathbf{10^{-3}}$ will be ignored.

Sample Input	Output for Sample Input
5 5711 3044 477 2186 3257 7746 3233 31 3336 1489 1775 134 453 4480 1137 6678 2395 5716 8757 2995 4807 8660 2294 5429 4439 4272 1366 8741 6820 9145	Case 1: 6641.81699183 Case 2: 2295.92880 Case 3: 1616.690325 Case 4: 4155.64159340 Case 5: 5732.01250253