

17. Draw the pentagon $ABCDE$, given $AB = 320$, $BC = 240$, $CD = 400$, $DE = 360$, and $EA = 200$ feet ; and angle at $B = 110^\circ$, and angle at $C = 117^\circ$. Measure AC and BD .

18. A man standing at a distance from a cathedral finds that the top of the spire is elevated 30° above the horizontal line on a level with the base of the cathedral ; he then walks 200 feet directly towards the cathedral on that line and finds the top of the spire to be elevated 60° ; find, by plotting, the height of the spire. (C, 1900.)

19. If you leave a certain point and walk 40 feet to the east, then 60 feet to the northeast, then 70 feet to the north, then 30 feet to the northwest, and then 100 feet to the southwest, how far is the point at last reached from the starting-point and from each of the angular points ?

20. From a point O within a pentagon the distances to the corners A , B , C , D , and E are respectively 36, 29, 32, 30, and 35 feet, and the angles AOB , BOC , COD , and DOE are respectively 71° , 56° , 49° , and 81° . Draw the pentagon and find the length of each side.

21. A mine has a vertical shaft 200 feet deep. From the bottom a tunnel is made for a distance of 300 feet on an upward slope of 20° . It is then continued at a slope of 30° . How far from the mouth of the shaft will the tunnel strike level ground ?

22. By plotting find approximately the parts and area of the triangle BCE within the quadrilateral $ABCD$; given $AD = 147$, $DC = 235$, angle $ADC = 90^\circ$, angle $DCB = 95^\circ$, angle $BAD = 111^\circ$, $AE = 95$, and $DE = 95$. (C, 1901.)