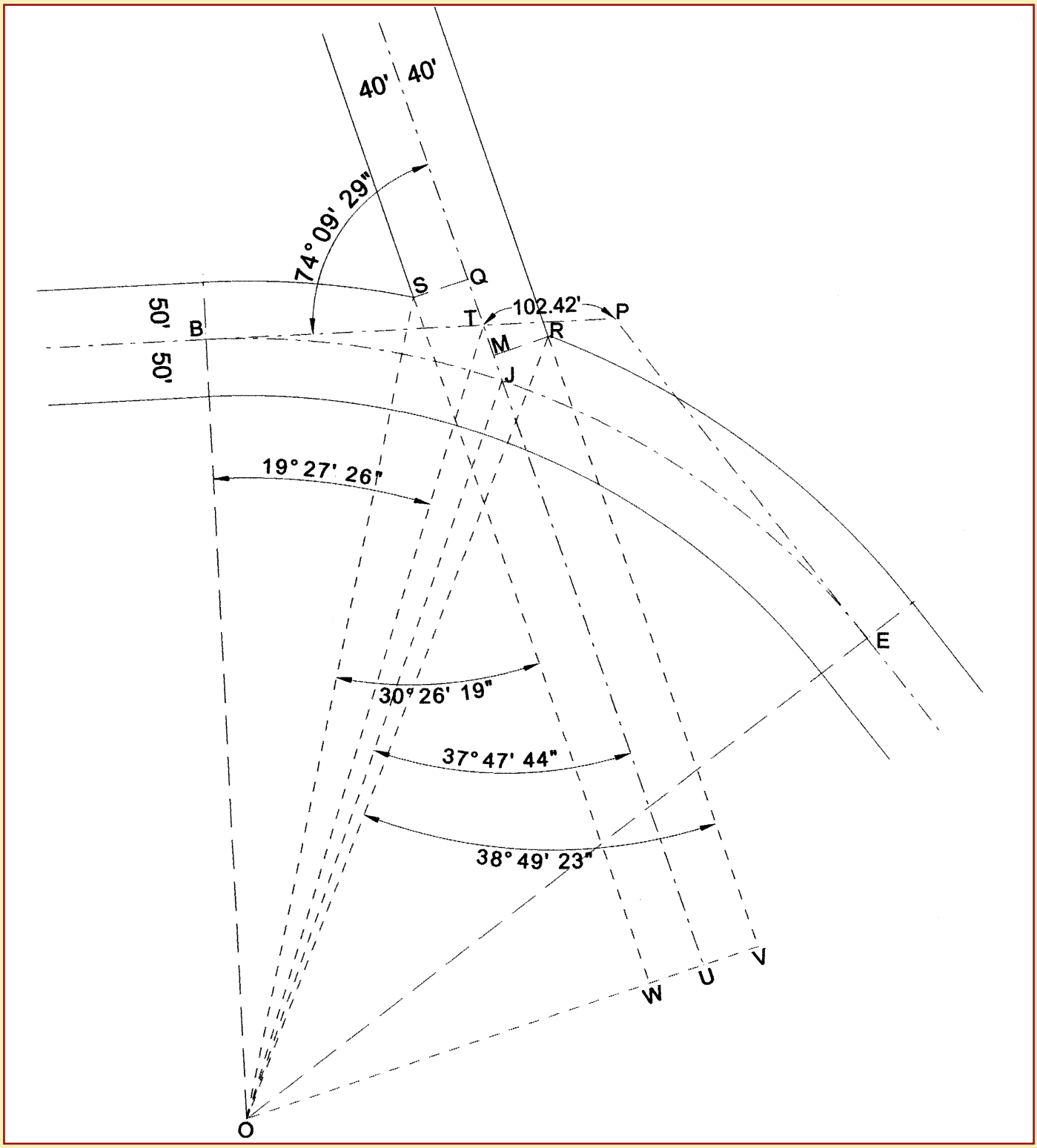
Solution to Problem 26



continued

Solution to Problem 26 *continued*

THE KEY TO SOLVING *ANY* STRAIGHT LINE-CURVE INTERSECTION IS TO FIND THE PERPENDICULAR DISTANCE BETWEEN THE STRAIGHT LINE (OR ITS PROLONGATION) AND THE RADIUS POINT. A NEAT TRICK IS TO CALL THE STRAIGHT LINE "NORTH" AND TRAVERSE FROM, IN THIS CASE, POINT "T" TO "P" (A GIVEN DISTANCE), "P" TO "E" (THE SEMI-TANGENT DISTANCE OF 319.687'), "E" TO "O" (THE RADIUS), OR "T" TO "B" TO "O". THE DIFFERENCE IN EASTINGS BETWEEN "O" AND "T" IS THE PERPENDICULAR DISTANCE REQUIRED, 376.900' FOR THIS PROBLEM. YOU CAN ALSO USE TRIANGLES BOT AND OTU AND SOLVE IT WITHOUT TRAVERSING.

$$\text{ANGLE OJU} = \arcsin\frac{376.900}{615} = 37°47'44'' \text{ and JU} = 615 \cos \text{OJU} = 485.975'$$

$$\text{ANGLE OSW} = \arcsin\frac{336.900}{665} = 30°26'19'' \text{ and SW} = 665 \cos \text{OSW} = 573.344'$$

$$\text{ANGLE ORV} = \arcsin\frac{416.900}{665} = 38°49'23'' \text{ and RV} = 665 \cos \text{ORV} = 518.092'$$

$$\text{ANGLE BOT} = \arctan\frac{217.267}{615} = 19°27'26 \text{ AND OT} = \frac{615}{\cos \text{BOT}} = 652.250'$$

ANGLE OTU = 180°- 74°09'29" - (90° – 19°27'26") = 35°17'57"

so TU = 532.331'

QT = SW-TU = 573.344'- 532.331' = 41.013'

QJ = SW-JU = 573.344'- 485.975' = 87.369'

MJ = RV-JU = 518.092'- 485.975' = 32.117'