

THE PROBLEM CORNER

Solution to Problem Number 1

The tangent to a circle from a point outside the circle is the mean proportional between the external portion of the secant and the total secant from the same point. Note that angle P-A-B and A-C-B Each equal one half of the arc A-B and are therefore equal to each other.

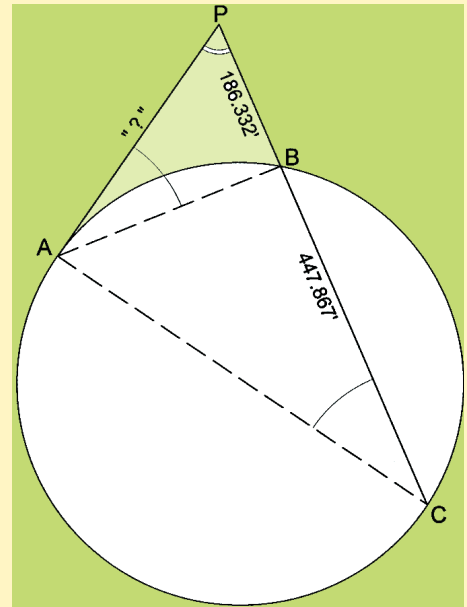
$$\frac{PA}{PB} = \frac{PB + BC}{PA}$$

$$\frac{PA}{186.332'} = \frac{186.332' + 447.867'}{PA}$$

$$PA \times PA = 118,171.568$$

$$PA = 343.761'$$

The radius is irrelevant. Plot a simple combination like PB = 1, PA = 2, and PC = 4 and you will see that it fits any radius!



Solution to Problem Number 2

Draw A', B', AND C' such that AT=AC'=AB', CT=CB'=CA', BT=BA'=BC'.

Draw A'B', B'C', and A'C'. Note that angle C'AB' = 122°01'30", ANGLE B'CA' = 107°16'36", and angle A'BC' = 130°41'54" (C'BA = TBA, A'BC = TBC, but ABT + TBC = 65°20'57", so C'BT + TBA = 130°41'54", and similarly for the other angles at A and C.)

A'C', A'B', and B'C' can be solved by the law of sines.

Angles A', B', AND C' can be solved by the law of cosines.

With all of the angles at A', B', and C' known, AB, BC, and AC can be solved from the "outside" triangles.

