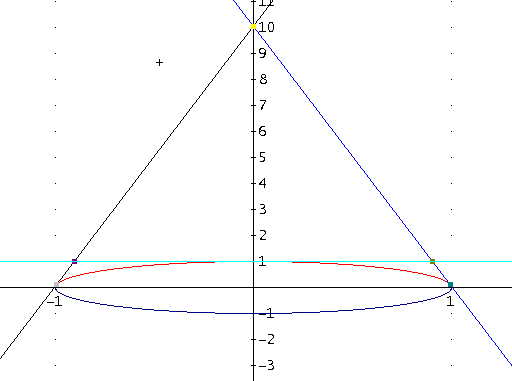
2010-6-4 Geometry Quickie by kmh

Let c be a circle and P be some point outside of it. The two tangents from P on c, touch c in A and B and |PA|=|PB|=10 cm. Now let C be an arbitrary point on the arc AB (the smaller arc close to P). The tangent on c at C intersects the tangent segments PA and PB in Q and R. Determine the perimeter of the triangle  PQR.



We define two points that lie on the circle, A and B:

We also define another point P that is outside the circle, and such that |PA|=|PB|=10 cm

Because the tangent is we are free to work with a semi-circle. The function for a full circle is . From this, we derive the upper half of the circle which is .

The equation of a tangent of a line at a given point is given by

We can now use this function for both A and B and solve the system to find where the 2 tangents intercept (i.e. find P).

By solving this system of 2 equations with 2 unknowns, we arrive at the following result:

This is our point P and its coordinates.

The reason why we need another system of 2 equations is that.

So we have:

The system gives out 6 solutions total:

I picked to work with. So it follows that from the previous definition of f(x). To get the points Q and R, plug in the variables to get the points where the slopes (equation of tangent lines) intercept with y=1:

By applying Pythagorean’s distance formula on QR, QC, and RC, and summing all three equations, we get **20** as the final answer.

Solved by Sitnikovski Boro 15.06.2010