No, that wasn't harsh. There is no worry to be harsh, because the problem makes sense or it doesn't. I posted it here for input. To me it makes sense because I wrote it, but I still have no clue whether it is right or wrong. It could be an interesting concept or a big mistake I made when I stayed up all night writing it. So your input is much appreciated.

I originally wanted to find an arc length (the distance along the actual function's line when drawn) that would show a pattern when different series where mapped to it.

I tried this before with no solid answer. So this time I tried to use the apex or vertex of the parabola and draw a line from the vertex to a point on the parabola. That would be a Prime number which here I used 3.

The problem was the given didn't appear to have enough information for the calculation. I new I wanted a segment of 3 between the vertex and point on the parabola, but I only new the length 3. But that is where you recommend to draw a picture. I am working on it. Because from the picture you will see where the right triangle comes from. And the angles we are working with.

But again I had a length of 3 along a right triangle. That is where the equations come in. In short I substituted the information of the x and y lengths into the trig pythagorean identity. From there I used the Scosine which will take to long to explain here but it is in the math section of my website.

I had to use the Scosine because all the trig identities I could find relied on the pythagorean theorem and would be just like setting a number equal to itself.

The reason behind such a complicated process was because while there are many right triangles there are only so many ones with a hypotenuse of 3. And only so many with 3 that will fit on a parabola.

So I hoped this process would find this right triangle. It may not occur at Pi radians along the arc length of the parabola, but maybe there would still be some pattern to the apex segments when the segment equals a Prime number.

I am not finished. I need to draw it out and show the graphics. But in case I am completely wrong, don't be afraid to tell me I am heading in the wrong direction.

Theory

If you take a triangle with for example, sides 3 and 5 units in length, you can spit the triangle into 2 solvable right triangles. So you can solve the triangle knowing only 2 sides. First solve the right angle with hypotenuse of 3. Take the value that lies on the 5 unit segment and subtract it from 5 and solve the new right triangle. It is that simple.

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Idea #1

A proposed way to find the "equivalent" of the slope in the x, y, and z axis.

$$slope\ in\ 2\ dimenstions = \frac{x}{y}$$

$$and\ the\ length\ of\ a\ line\ in\ 2\ dimensions = [x^2 + y^2 = z^2]\ by\ the\ Pythagorean\ Thereom$$

$$In\ 3\ dimenstions\ (x,y,z)$$

The following is just a brainstorm. It would take much investigation to prove it to be true.

$$\frac{x}{y} = \ tangent$$

$$\frac{y}{x} = cotangent$$

$$\left(\frac{\frac{x}{y}}{z}\right)^2 + \left(\frac{\frac{y}{x}}{z}\right)^2 = 1^2 = [a^2 + b^2 = c^2]$$

$$\frac{\frac{\frac{x}{y}}{z}}{\frac{\frac{y}{x}}{z}} = slope\ in\ z\ axis$$

$$\frac{\frac{x}{y}}{z} \cdot \frac{\frac{y}{x}}{z}$$

$$= \frac{\frac{x}{y}}{\frac{y}{x}}$$

$$= \frac{x}{y} \cdot \frac{y}{x}$$

$$= \frac{x^2}{y^2} = \textit{slope in z axis}$$

Of course this is untested and most likely completely wrong. It is just there to show a concept.

Idea #2

A curve's shape differs from a circle if it is both a curve in (x / z) axis and the (y/ z) orthoginal viewports. The view determines how the circle is modified.

$$L = Scosine = \frac{|\cos[\theta_1] - \cos\theta_2]|}{\cos[\theta_2]} \cdot r$$

$$\cos[\theta_1] = 1$$

3 *our given Prime number which is also the hypotenuse becomes*

$$5 = \frac{1}{L} + x$$

The cosine of the right triangle is $\frac{x}{5}$

$$5 = \frac{1}{\frac{1-\frac{x}{5}}{\frac{x}{5}}} + y$$

$$\frac{\frac{x}{5}}{1-\frac{x}{5}}+y=5$$

$$\frac{\frac{x}{5}}{1-\frac{x}{5}}=5-y$$

$$\frac{x}{5}=(1-\frac{x}{5})(5-y)$$

$$x=\frac{1}{5}(5-y-x+\frac{x\cdot y}{5})$$

$$x=1-\frac{y}{5}-\frac{x}{5}+\frac{xy}{25}$$

$$5\cdot(\frac{4}{5}\cdot x-1)=-y+\frac{xy}{5}$$

$$4x-1=-y+\frac{xy}{5}$$

$$\frac{5\cdot(4x-1)}{x\cdot y}=-y$$

$$\frac{5\cdot(4x-1)}{x}=-y^2$$

$$y^2=-1\cdot[\frac{5\cdot(4x-1)}{x}]$$

as previously derived

$$y=\sqrt{(5-x)(5+x)}$$

$$y=\sqrt{5^2-x^2}$$

substitute

$$[\sqrt{5^2 - x^2}]^2 = -1 \cdot [\frac{5 \cdot (4x - 1)}{x}]$$

$$x^2 - 5^2 = \frac{5 \cdot (4x - 1)}{x}$$

$$x^3 - 25x = 5 \cdot (4x - 1)$$

$$5x^3 - 125x = 4x - 1$$

$$5x^3 - 125x + 1 = 4x$$

$$5x^2 + \frac{1}{x} - 125 = 4$$

$$5x^2 + \frac{1}{x} - 125 = 0$$

Plug into the quadratic equation:

$$\frac{-b \pm \sqrt{b^2 - 4 \cdot a \cdot c}}{2a}$$

$$\frac{-1 \pm \sqrt{-1^2 - 4 \cdot 5 \cdot -125}}{2*5}$$

$$\frac{-1 \pm \sqrt{1+500}}{10}$$

$$\frac{-1 + \sqrt{501}}{10} \text{ or } \frac{-1 - \sqrt{501}}{10}$$

$$x = 2.1383029 \text{ or } x = -2.33830$$

Plug into right triangle trigonometric ratios:

$$\cos\theta = \frac{Adjacent}{Hypotenuse} \textit{ on a right triangle}$$

$$\cos\theta = \frac{2.1383029}{5}$$

$$\theta = \cos^{-1}[\frac{2.1383029}{5}]$$

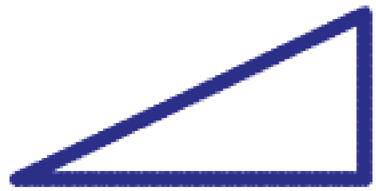
$$\theta = 64.6808 \ degrees$$

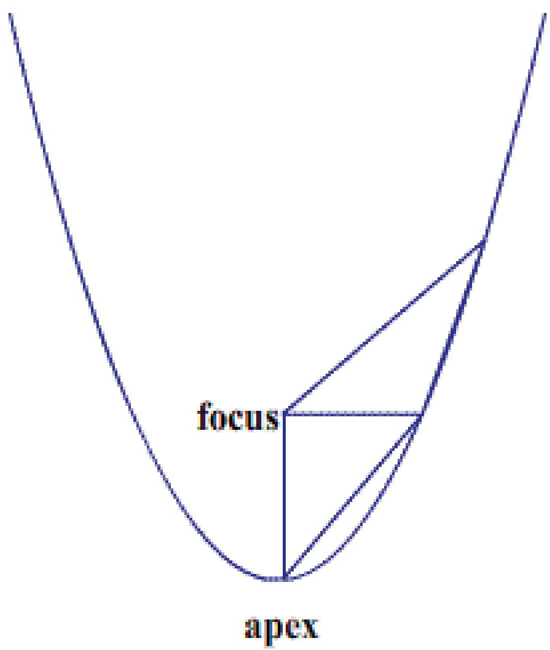
A triangle that is split into 2 seperate right triangles with a hypotenuse of 5 will have a corresponding angle of 64 degrees.

If this works it means we can split any triangle into 2 right triangles and solve for the triangle knowing only 2 sides!!!!!!!

The only part in question is $b = 1$.

$$5x^2 + 1x^{-1} - 125 = 0$$

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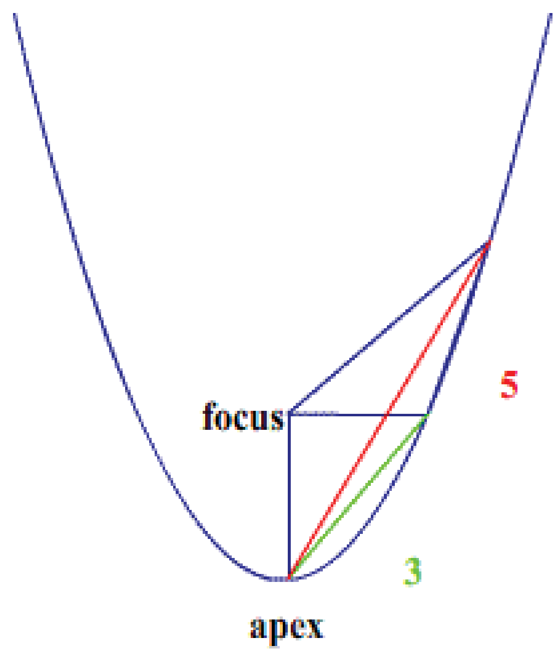
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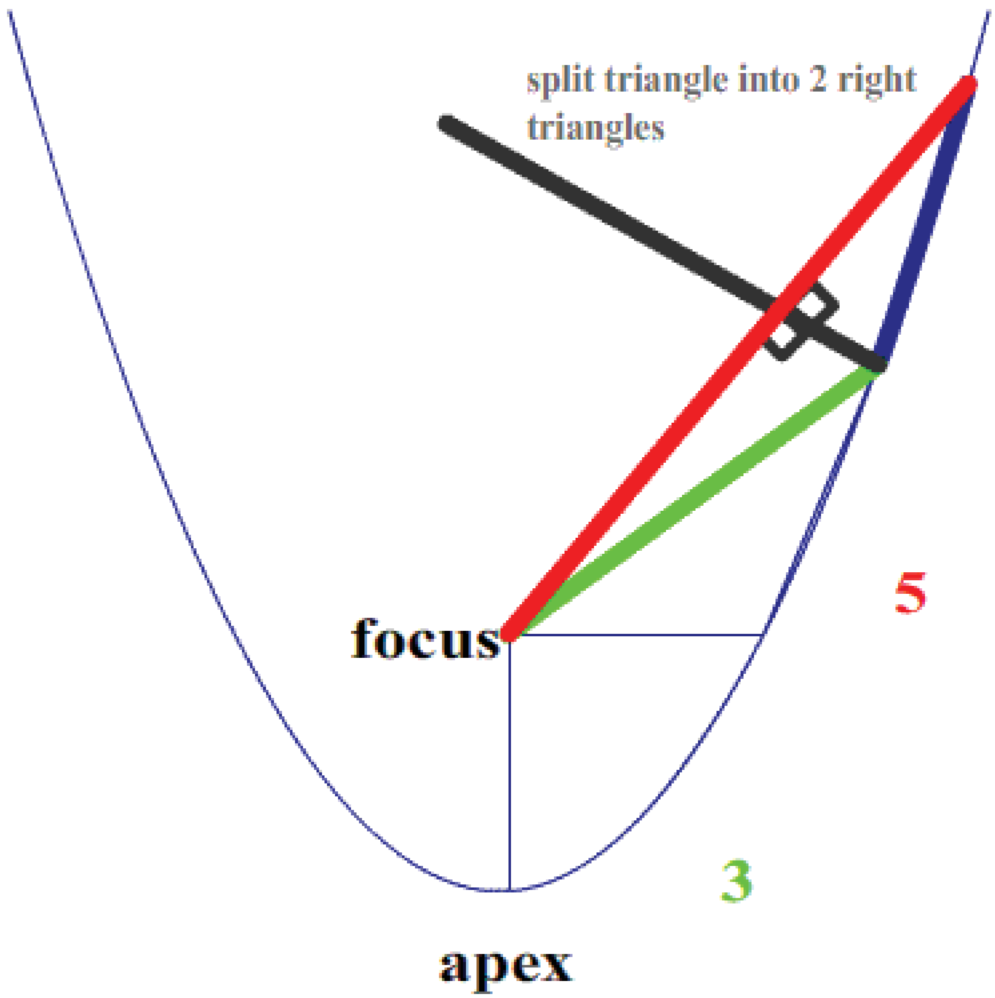
split triangle into 2 right triangles
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