LETTER TO THE EDITOR

Dear Sir,

In our class, we were discussing applications to the discriminate of the quadratic function and came up with another approach to Q1037 (Vol 34 No 3) without calculus:

$$y = f(x) = \frac{x}{1 + n^2x^2} \qquad \text{for} \quad n = 1, 2, 3, \ldots.$$

This quadratic equation (in x) can be expressed as:

$$n^2yx^2 - x + y = 0$$

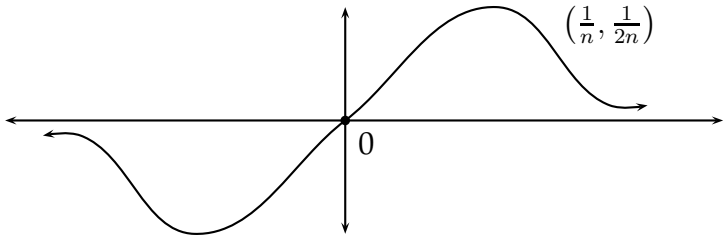
and for x to be real: $\Delta \geq 0$

$$\begin{array}{ll} \therefore & 1 - 4n^2y \cdot y \geq 0 \\ \text{i.e.} & (1 - 2ny)(1 + 2ny) \geq 0 \\ \therefore & -\frac{1}{2n} \leq y \leq \frac{1}{2n} \\ \text{i.e.} & -\frac{1}{2n} \leq f(x) \leq \frac{1}{2n}. \\ \text{hence} & f(x) = y \leq \frac{1}{2n}. \end{array}$$

We also noticed when $y = \frac{1}{2n}$ then $\Delta = 0$ which meant a turning point has occurred at

$$x = -\frac{b}{2a} = \frac{(-1)}{2n^2y} = \frac{1}{2n^2\frac{1}{2n}} = \frac{1}{n}.$$

Also $f(x)$ is an odd function. So the graph looks like the following:



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This is a very encouraging letter. If you would like to write to us about some aspect of Mathematics which interests you (or about which you would like to know more) then why not write! - Editor.