

### Question #42687, Math, Calculus

Use the Rational Zeros Theorem to write a list of all possible rational zeros of the function.

$$f(x) = 3x^3 + 39x^2 + 39x + 27$$

help me please show your work

**Answer.**

According to Rational Zeros Theorem, if a polynomial function, written in descending order of the exponents, has integer coefficients, then any rational zero must be of the form  $\pm p/q$ , where  $p$  is a factor of the constant term and  $q$  is a factor of the leading coefficient.

In our case, constant term = 27, leading coefficient = 3, so

$$p = 1, 3,$$

$$q = 1, 3, 9, 27$$

Therefore, all possible rational zeros (roots) are:  $\pm 1, \pm \frac{1}{3}, \pm \frac{1}{9}, \pm \frac{1}{27}$ .