SOME APPLICATIONS OF DENSITY THEOREM

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ABSTRACT

We know that, both rationals and irrationals are dense in $\mathbb{R}$. Therefore, $\mathbb{R}$ has a dense subset, whose complement is also dense in $\mathbb{R}$. In this paper, I am trying to construct so many counter examples by using this idea, such that

- *Construction of a function which is discontinuous everywhere.*
- *Construction of a function which is continuous exactly at one point (Or at finitely many points).*
- *Construction of a function which is differentiable at exactly one point (Or at finitely many points).*

  I am presenting all these constructions as an application of Density theorem.

KEYWORDS: *Application of Density Theorem, Sequence of Rationals*