



# A Note on a Generalization of Sturm's Comparison Theorem

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**Abstract:** In this note, an attempt is made to generalize the Sturm's comparison theorem. Let  $t_1$  and  $t_2$  be two consecutive zeros of a solution  $y$  of an implicit equation

$$g_1(y''(t)) + r(t)g_2(y(t)) = 0$$

and  $x$  be a solution of

$$f_1(x''(t)) + q(t)f_2(x(t)) = 0.$$

Under certain conditions stated on the given functions  $f_1, f_2, g_1, g_2, q$  and  $r$ , we show that  $x$  has a zero between  $t_1$  and  $t_2$ . Sturm's comparison theorem turns out to be a consequence of the established result.

**Keywords:** *Implicit differential equations; comparison theory.*

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