

QUERIES - *Real Analysis Exchange* Vol. 9 (1983-84)

The Inroads article by L. Mišik appearing in this issue of the Exchange, which was originally submitted to the Queries Section, contains three open problems which will be assigned the numbers 158, 159, and 160 in the obvious order.

The Inroads article by M. Jodeit, Jr., appearing in this issue of the Exchange is a solution to a question sent to the participants of the sixth summer symposium by J. Marshall Ash and is assigned the number 161.

The following two questions were submitted by J. Ceder and D. Ganguly in connection with their article appearing in the Research Section of this issue of the Exchange.

- 162. Does there exist a linear set A of second category such that the projection of $A \times A$ onto each line has empty interior?
- 163. Does there exist a planar set of positive Lebesgue measure whose projection onto each line has empty interior?

The following two questions were submitted by J. Ceder.

- 164. E.S. Thomas Jr. has characterized the Baire 1 functions as those functions whose graphs are the intersection of a sequence of simply connected open sets. Does there exist a characterization of the Baire 1, Darboux functions as those functions whose graph is the intersection of a sequence of "special" simply connected open sets? (See the discussion following THEOREM F in the survey on Baire 1, Darboux functions in this Exchange.)
- 165. It is not true that the sum of two Baire 1, Darboux functions is necessarily Baire 1, Darboux, and consequently, the average of two Baire 1, Darboux functions need not be Baire 1, Darboux. What are necessary and sufficient conditions on arbitrary f and g , where $f \leq g$, in order to insure that a Baire 1, Darboux function can be inserted between them? (A more complete discussion of this problem can be found following THEOREM K in the survey on Baire 1, Darboux functions in this Exchange.)

The next set of questions were submitted by L. Larson in connection with his survey in this issue of the Exchange.

166. If f is an approximately continuous function with a nonnegative symmetric derivative everywhere, then is f nondecreasing?
167. Is a measurable approximately symmetrically differentiable function approximately differentiable almost everywhere?
168. Can a symmetric function be discontinuous on an uncountable set?
169. Must an approximately symmetrically differentiable function be measurable?
170. If f is symmetrically continuous, then is f in Baire class one?
171. If f is symmetrically differentiable (allowing infinite values), then is f discontinuous on a countable set? (clairseme set?)
172. Find a condition which is both necessary and sufficient to ensure that a finite symmetric derivative is a Darboux-Baire one function.
173. If f is a measurable function with the Darboux property and such that the lower second symmetric derivative of f is nonnegative everywhere, then is f convex?