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P R O B L È M E S

P 233, R 1. Professors Roy Olsen and Ernest Michael have sent us a letter which reads:

"The following is a negative solution to Problem 233.

J. Dieudonné asked:

If $f\colon X \to Y$ is continuous, onto, and closed, if X is Hausdorff, Y paracompact and first-countable, and if each $f^{-1}(y)$ is normal and countably compact, must X be normal?

The answer is no, even if Y is compact metric and X sequentially compact and locally compact.

M. E. Rudin constructed ([1]) a sequentially compact, locally compact Hausdorff space X which is not normal, and which has a closed subset A such that A is normal and $X - A$ is countable and discrete. Let $Y = X/A$ (the space obtained from X by identifying A to a point), and let $f\colon X \to Y$ be the quotient map. Clearly, f is closed. Moreover, Y is countable, countably compact, and Hausdorff, so Y is compact metrizable. (In fact, Y is just a convergent sequence.)

In the above example, X is completely regular. A different example can be constructed to show that Dieudonné's conditions do not even imply that X is regular.

The above examples stand in contrast to the following well-known result:

If $f\colon X \to Y$ is perfect (i. e., f is continuous and closed, and every $f^{-1}(y)$ is compact), if X is Hausdorff, and if Y is paracompact, then X is paracompact."

VI, p. 331. Letter of December 2, 1971.

([1]) M. E. Rudin, *A technique for constructing examples*, Proceedings of the American Mathematical Society 16 (1965), p. 1320-1323; Example 1 and remark in the middle of p. 1323.

P 671, R 1. The answer is negative([2]).

XX. 2, p. 228.

([2]) K. E. Thomas, *Regarding a question about the least element map*, this fascicle, p. 39-40.

P 704 et **P 705, R 1.** The author of the problems has informed us that positive answers have been announced by J. Karnofsky (3).

XXII. 1, p. 196.

(3) J. Karnofsky, *Varieties generated by finite simple semigroups*, Notices of the American Mathematical Society 17 (1970), p. 939.

P 711, R 2. Une autre solution a été donnée par D. E. Ramirez (4).

XXII. 2, p. 337.

(4) D. E. Ramirez, *Remark on Fourier-Stieltjes transforms of continuous measures*, this fascicle, p. 81-82.

P 729, R 2. The announced answer has already appeared in print (5).

XXIII. 1, p. 97 et 176.

(5) B. B. Epps, Jr., *Some curves of prescribed rim-types*, this fascicle, p. 69-71.

JAN WASZKIEWICZ (WROCŁAW)

P 818. Formulé dans la communication *On cardinalities of algebras of formulas for ω_0-categorical theories.*

Ce fascicule, p. 11.

D. A. MORAN (EAST LANSING, MICHIGAN)

P 819 - P 821. Formulés dans la communication *Residual sets not of maximum dimension.*

Ce fascicule, p. 37.

S. F. KAPOOR (KALAMAZOO, MICHIGAN)

P 822. Formulé dans la communication *Expanding stars.*

Ce fascicule, p. 68.

J. E. VALENTINE AND S. G. WAYMENT (LOGAN, UTAH)

P 823 et **P 824.** Formulés dans la communication *Metric characterizations of Banach spaces.*

Ce fascicule, p. 89 et 94.

COKE S. REED (AUBURN, ALABAMA)

P 825. Formulé dans la communication *Concerning two methods of defining the center of a dynamical system, II.*

Ce fascicule, p. 122.

J. KUCHARCZAK (WROCŁAW)

P 826 et **P 827.** Formulés dans la communication *A characterization of a-convolution.*

Ce fascicule, p. 142.

J. KIJOWSKI (WARSZAWA)

P 828. Let M be a differentiable, Riemannian, parallelizable manifold and let $S(a, x)$ be a complete integral of the Hamilton-Jacobi equation

$$|\mathrm{grad}_x S(a, x)|^2 + V(x) = \text{constant}, \tag{1}$$

where $V \in C^\infty(M)$.

Under what conditions on $R(a)$, the function

$$\psi(x) = \int R(a) e^{iS(a,x)} da$$

is also representable in the form

$$\psi(x) = \int R'(\beta) e^{iS'(\beta,x)} d\beta,$$

for any complete integral $S'(\beta, x)$ of (1)?

New Scottish Book, Probl. 865, 3. 12. 1971.