Let $B_N(G) = \max|n_i - n_j|$, where the maximum is taken over all numbers, n_i, n_j, of adjacent vertices. The bandwidth of G is B(G), the minimum over all numberings N of $B_N(G)$. A graph is narrow-banded if its bandwidth does not exceed its degree. Theorem. The bandwidth of a cubic graph is at least as great as its girth. Theorem. Narrow-banded cubic graphs are planar. Theorem. Nonseparable narrow-banded cubic graphs are Hamiltonian, hence 4-colorable. Call a cubic graph primary if it is narrow-banded and 3-connected. Theorem. The number of distinct narrow-banded numberings of primary cubic graphs on 2n vertices is F_n, the nth Fibonacci number. Theorem. The number of non-isomorphic primary cubic graphs on 2n vertices is at most $(1/2)(F_k + F_{2k})$ for $n = 2k$, and $(1/2)(F_{k+2} + F_{2k+1})$ for $n = 2k + 1$. (Received November 6, 1969.)

672-613. BERNARD W. LEVINGER, Colorado State University, Fort Collins, Colorado 80521. An inequality for nonnegative matrices.

Theorem. Let $A \geqq 0$ be a matrix with nonnegative components. Then $f(t) = p(tA + (1 - t)A^T)$ is a monotone nondecreasing function of t, for $0 \leqq t \leqq 1/2$, where p(C) denotes the spectral radius of the matrix C. This extends a theorem of Ostrowski. The case of constant f(t) is discussed. (Received November 6, 1969.)

672-614. JOHN H. GEORGE and JAMES W. THOMAS, University of Wyoming, Laramie, Wyoming 82070. A lax-equivalence theorem for the line method. Preliminary report.

Consider the general parabolic partial differential equation in time and space variables. If the derivatives with respect to the space variables are replaced by difference approximations, an ordinary differential equation is obtained. This process is called the line method in the Russian literature. We develop a lax-equivalence theorem which insures that the solution to the approximate ordinary differential equation converges to the solution of the original partial differential equation. (Received November 6, 1969.)

672-615. ALFRED GRAY, University of Maryland, College Park, Maryland 20742. Weak holonomy groups.

Let M be a Riemannian manifold and assume the structure group of the tangent bundle of M can be reduced from O(n) to a connected Lie group G. For $m \in M$ we denote by M_m the tangent space to M at m. Definition. A subspace $P \subseteq M_m$ is said to be special provided (i) there exists a proper subspace $P' \subset P$ such that for all $g \in G$, g(P) is determined by g(P'); (ii) if $P' \subset P \subseteq P''$ and g(P') determines g(P'') for all $g \in G$ then $P = P''$. Definition. We say that G is a weak holonomy group of M provided the following condition is satisfied: for each $m \in M$ and differentiable loop γ in M with $\gamma(0) = \gamma(1) = m$ there exists $g \in G$ such that $\tau_\gamma|P = g|P$ whenever P is a special subspace of M_m of minimal dimension with $\gamma'(0) \in P$. Here τ_γ denotes parallel translation along γ. We investigate weak holonomy groups in the case when the group G is compact and acts transitively and effectively on a sphere. If a Riemannian manifold has weak holonomy group U(n), then M is a nearly Kähler manifold. The curvature operator of a nearly Kähler manifold satisfies certain identities which generalize those for Kähler manifolds; consequently a great deal can be said about the topology and geometry of nearly Kähler manifolds. (Received November 6, 1969.)