In this paper we study several interrelated extremal graph problems: (i) Given integers n, e, m, what is the largest integer f(n,e,m) such that every graph with n vertices and e edges must have an induced m-vertex subgraph with at least $f(n, e, m)$ edges? (ii) Given integers n, e, e', what is the largest integer $g(n, e, e')$ such that any two n-vertex graphs G and H, with e and e' edges, respectively, must have a common subgraph with at least $g(n, e, e')$ edges? Results obtained here can be used for solving several questionsrelated to the following graph decomposition problem, previously studied by two of the authors and others. (iii) Given integers n, r, what is the least integer $t = U(n, r)$ such that for any two n-vertex r-uniform hypergraphs G and H with the same number of edges the edge set $E(G)$ of G can be partitioned into $E_1, ..., E_t$ and the edge set $E(H)$ of H can be partitioned into $E'_1, ..., E'_t$ in such a way that for each i, the graphs formed by E_i and E'_i are isomorphic.

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