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Student Session:

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Title: *Classification of KdV-type Bi-Hamiltonian systems*

Abstract: The KdV-type Bi-Hamiltonian system has the following form: $P = P_1$ and $Q = Q_1 + R_k$, where P_1, Q_1 are homogeneous first-order Hamiltonian operators, R_k is a homogeneous k-st order Hamiltonian operator, and all operators are mutually compatible. Equations of this type include the KdV, AKNS, Kaup-Broer, Dispersive Water Waves and Dym equations. Conditions under which homogeneous operators of the first, second and third orders are Hamiltonian are well known. On the other hand, the compatibility of two operators is a way more complicated problem. In this talk, we illustrate the compatibility conditions and extensions between P_i and R_3. Then, we will use the classification of operators R_3 when the number of dependent variables is 3 and 4 to the aim of classifying trios in these dimensions.