Equivalence classes of the second order ODEs with the constant Cartan invariant

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Second order ordinary differential equations that possesses the constant invariant are investigated. Four basic types of these equations were found. For every type the complete list of nonequivalent equations is issued. As the exampes the equivalence problem for the Painleve II equation, Painleve III equation with three zero parameters, Emden equations and for some other equations is solved.

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