

Exercise 4B	Temperature coefficient of resistance		<i>Theory:</i>
Team:	Name:		<i>Experiment:</i>
Date:	Weeks day and hour:	Major, group:	<i>Remarks</i>



The equation for resistivity based on the geometric dimensions and resistance::

.....



How to calculate two-parameter linear regression coefficients and their uncertainty:

.....

.....



How to calculate α with use of two-parameter linear regression coefficients:

.....



How to calculate wire cross-section area and total wire length, if wire diameter, spring diameter and number of windings are known:

.....

.....



Formula for uncertainty (with use of propagation principle) for $\Delta\alpha$ and $\Delta\rho$:

.....

.....

Fill the Table 1 with measured voltage, current and temperatures.

Table 1	Temperature measurements				
Quantity, units:	U []	I []	T ₁ , T ₂ , T ₃ , ... []	T (average)	R []
List of values					

Results of linear regression estimation of R vs T_d plot:

$$a = \dots \pm \dots \quad [\quad] \quad b = \dots \pm \dots \quad [\quad]$$

Fill the Table 2 with measured wire parameters and calculated wire area, wire length, resistance in room temperature, resistivity, temperature coefficient of resistance and their uncertainties. In the column headers, type appropriate units.

Table 2	Wire parameters						Resistivity	TC
Quantity, units:	d []	D []	n []	s []	l []	R_0 []	ρ []	α []
Value								
Uncertainty								

Conclusions: