

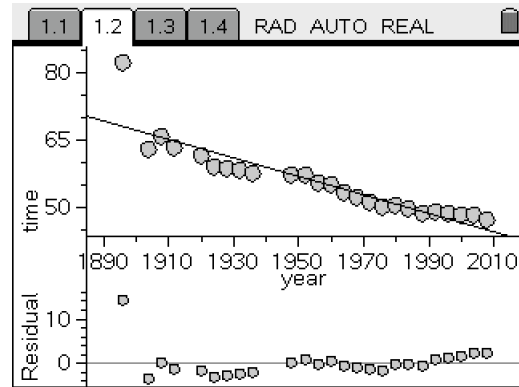
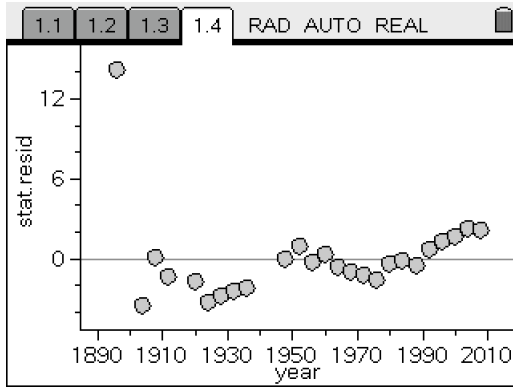
Everything you need to do with Linear Regression using the TI-Nspire: Olympic Swimming (part 2)

Here are the Olympic gold medalists and winning times from the men's 100 *m* Freestyle event.

Year	Gold Medal Winner	time
1896	Alfred Hajos, Hungary	1:22.2
1904	Zoltan de Halmay, Hungary	1:02.8
1908	Charles Daniels, United States	1:05.6
1912	Duke Kahanamoku, United States	1:03.4
1920	Duke Kahanamoku, United States	1:01.4
1924	John Weissmuller, United States	59.0
1928	John Weissmuller, United States	58.6
1932	Yasuji Miyazaki, Japan	58.2
1936	Ferenc Csik, Hungary	57.6
1948	Wally Ris, United States	57.3
1952	Clark Scholes, United States	57.4
1956	Jon Henricks, Australia	55.4
1960	John Devitt, Australia	55.2
1964	John Schollander, United States	53.4
1968	Mike Wenden, Australia	52.2
1972	Mark Spitz, United States	51.22
1976	Jim Montgomery, United States	49.99
1980	Jorg Woithe, East Germany	50.40
1984	Rowdy Gaines, United States	49.80
1988	Matt Biondi, United States	48.63
1992	Aleksandr Popov, Unified Team	49.02
1996	Aleksandr Popov, Russia	48.74
2000	Pieter van den Hoogenband, Netherlands	48.30
2004	Pieter van den Hoogenband, Netherlands	48.17
2008	Alain Bernard, France	47.21

Data is entered and graphed in Part I of this activity.

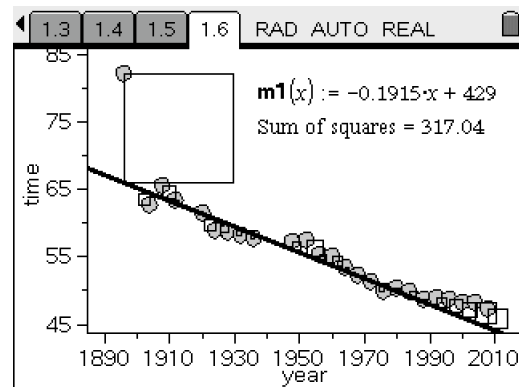
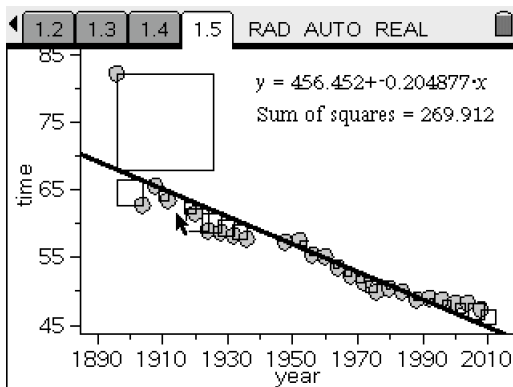
To make a residual plot, insert a new Data & Statistics page. Select “year” for the *x*-axis and “stat.resid” for the *y*-axis. Do the residuals have a random scatter?



Alternately, on the scatterplot page, WITH THE LINE SHOWING, menu→4: Analyze→7: Residuals→2: Show Residual Plot. Residual plot will appear beneath the scatterplot.

You can use this menu to show the “residual squares” on the scatterplot—using either the regression model or a moveable line (similar to Key Curriculum’s Geometer’s Sketchpad activity or website).

Move the moveable line to see how small you can get the Sum of squares.



If the relationship between the variables is not linear, then correlation, regression and inference for the slope are not useful—check by plotting the data and the residuals (**not** by checking the value of the correlation coefficient, r). The scatterplot of the data should be approximately linear and the residual plot should show random scatter.

Check the usefulness of the regression model (inference for regression). Note the output shows both s and SE_{Slope} .

	G	H	I
•	=LinRegBx('		=LinRegT
1	Linear Reg..	Title	Linear Reg..
2	Eqn	a+b*x	Alternate H..
3	456.452	RegEqn	a+b*x
4	-0.204877	t	-9.97266
5	0.812174	PVal	8.04963E*...
1/1	="Linear Reg t Test"		

	G	H	I
•	=LinRegBx('		=LinRegT
6	-0.901207	df	23.
7	{14.19461...	a	456.452
8		b	-0.204877
9		s	3.42568
10		SEslope	0.020544
1/1	="Linear Reg t Test"		