

Lines of Best Fit on TI-Nspire CAS

Oil Changes and Engine Repair

1. The table gives data relating the number of oil changes per year to the cost of car repairs. Plot the data with the number of oil changes on the horizontal axis on your TI-Nspire CAS calculator.

Oil Changes Per Year	3	5	2	3	1	4	6	4	3	2	0	10	7
Cost of Repairs	300	300	500	400	700	400	100	250	450	650	600	0	150

2. Is the data linear? If so, draw a best-fit line. Use the Add Movable Line. Adjust your movable line to fit the data best. Add residual squares and try to minimise this value by rotating and translating your movable line.

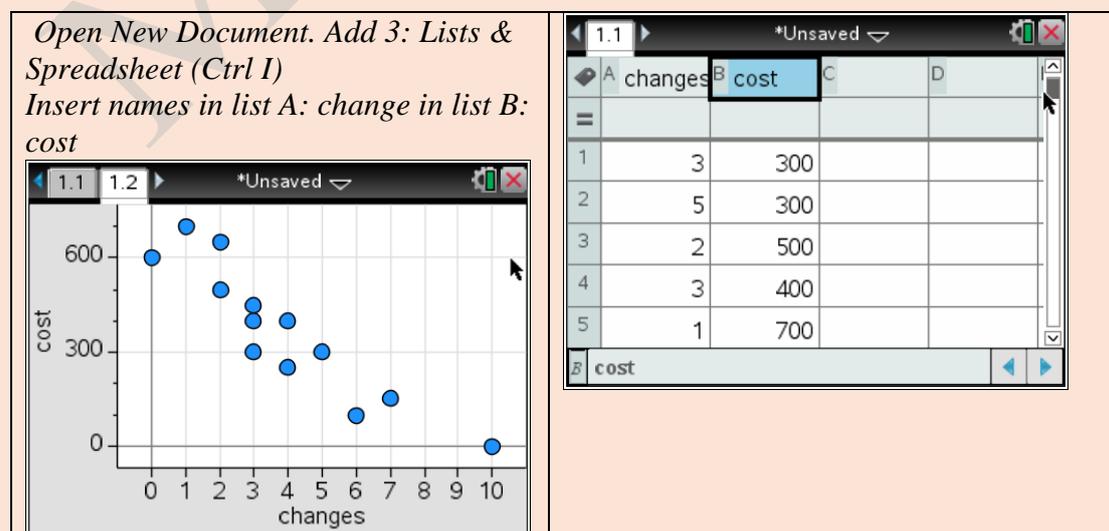
3. Find the slope of the line. Describe in words what the slope represents.

4. Find the x - and y -intercepts. Explain in terms of oil changes and engine repairs what each represents.

5. Write the equation of the line.

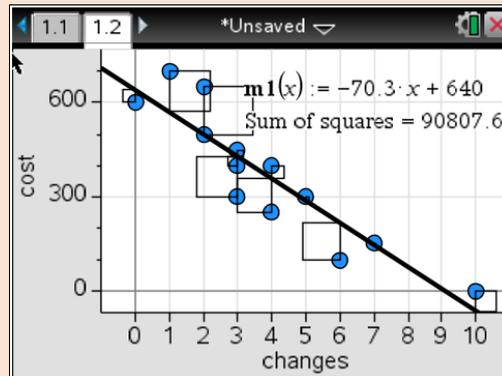
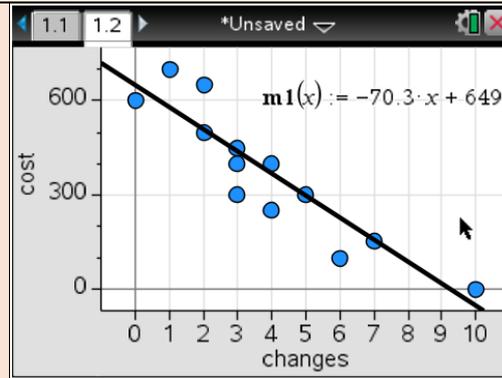
6. Use the equation to predict the cost of engine repairs if the car had four oil changes. How accurate do you think your prediction is? Explain your answer.

1. The table gives data relating the number of oil changes per year to the cost of car repairs. Plot the data with the number of oil changes on the horizontal axis.



Then Add 5: Data & Statistics. Click on each axes to add variables. Then Menu, 4: Analyze, 2: Add Movable Line. And 7: Residuals, 1: Show Residual Squares. Rotate and translate the line to minimise sum of the squares.

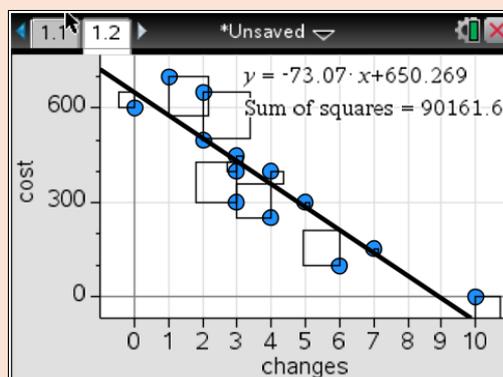
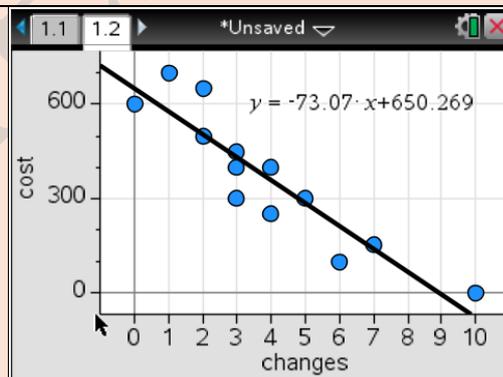
Play a game who can get the smallest sum of residual squares.



Remove Movable Line. Menu, 4: Analyze, 6: Regression, 1: Show Linear (mx+b).

Find the least squares regression line.

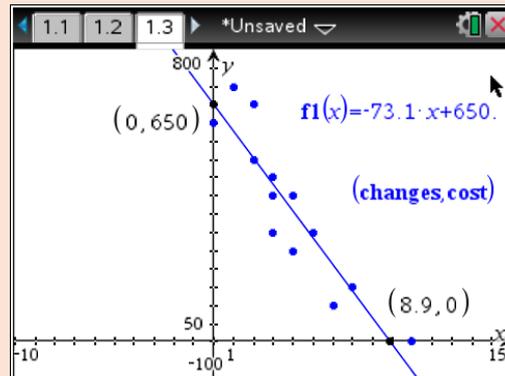
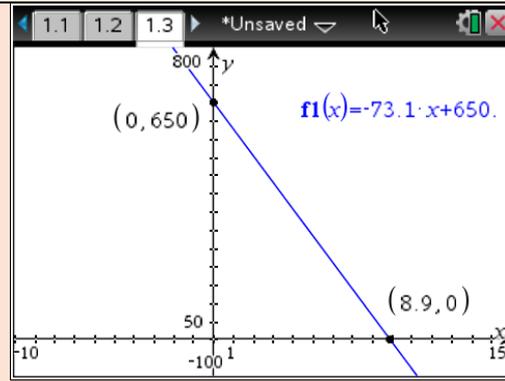
Check the sum of residual squares for this line.



Insert a new page 2: Add Graphs & Geometry. Copy the regression equation into $f1(x)$. Use Analyze Graph to find the x -intercept. Insert a Calculator page.

Hint: To save the regression equation, find the regression line in the spreadsheet screen and save as $f1(x)$.

To see the scatterplot in the Graph screen, Menu, Entry, Scatterplot and select your variables from var.



Find $f1(0)$ for a y -intercept, $f1(4)$ and solve for zero to get x -intercept again. Ctrl G to hide the entry line.

