

Warm Up

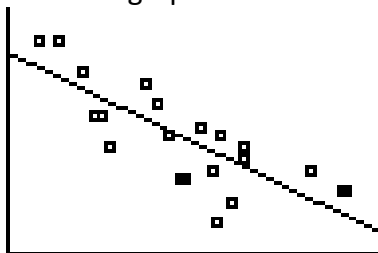
Regression Review

Example: 2009 car efficiency (retrieved and edited from [a compiled Google document of 23 cars' data](https://docs.google.com/spreadsheets/d/1Vpn1gMPSbhZeuNH6QewadgXUyrttR7E9raQxaI5_AYE/edit?pli=1#gid=0))
https://docs.google.com/spreadsheets/d/1Vpn1gMPSbhZeuNH6QewadgXUyrttR7E9raQxaI5_AYE/edit?pli=1#gid=0

The following table displays miles per gallon (mpg) and mass in kilograms (kg) for 23 models of cars:

Model of Car	Average mpg (highway and city)	Mass (kg)
Aston Marton DBS Coupe M-6	13	1695
Aston Marton V8 Vantage A-S6	15	1548
Audi R8 M-6	15	1560
Audi TT Roadster Quattro A-S6	24	1445.976
Cadillac XLR 4.4L A-S6	17	1725.93
Chevrolet Corvette 6.2L M-6	19	1519
Lamborghini Murcielago A-S6	11	1650
Mercedes Benz SL550 A-7	16	1911.66
Mercedes Benz SL600 A-5	14	2018.115
Mercedes Benz SL63 AMG A-S7	14	2007.243
Pontiac Solstice 2.0L A-5	21	1305
Saturn Sky 2.0L A-5	21	1330
Jaguar XK A-6	19	1662.963
Mini M-6	28	1208.604
Mitsubishi Eclipse M-5	22	1483
Audi A5 Quattro A-S6	20	1610
Chevrolet Aveo 5 A-4	28	1155
Chevrolet Cobalt M-5	25	1276.101
Ford Mustang 4.0L A-5	19	1519.815
Ford Mustang 5.4L A-5	16	1635.33
Mazda RX-8 M-6	18	1350
Nissan GT-R A-S6	18	1730
Pontiac G3 Wave 5 A-4	28	1150

- Which is the independent variable? _____
- Which is the dependent variable? _____
- A graph of the scatterplot and linear regression line looks like the graphic to the left.



Steps to graph (after data is entered into L₁ and L₂):

STAT, over to CALC, down to 4: LinReg (ax+b), VARS,
over to Y-Vars, 1: Function, Y₁, ENTER, ZOOM 9

The equation given is: $y = -0.016x + 43.69$

4. The constant (y -intercept) is 43.69. This means if $x = 0$ (where x is the mass (kg) of the car), then y (the predicted mpg) is 43.69.
 - a. Does this make sense practically? _____
 - b. Why or why not? _____

5. The slope is - 0.016. This means that: _____

6. To interpret r and r^2 :
 - a. r (correlation coefficient) is - 0.8037, which indicates a _____, _____ relationship between the mass of the car and the predicted mpg.
 - b. r^2 (coefficient of determination) is 0.646, which tells us that approximately _____ % of the variability in the _____ is explained by the _____.

7. What is the predicted mpg for a car with mass of 2005 kg? (Show your work)

8. Is this model a good predictor for a car with a mass of 2005 kg? Explain why or why not.

9. Would this linear regression model be a good predictor for cars manufactured in 2015? Explain why or why not.

MAIN IDEAS: List the Main Ideas for Today's Lesson
