# Standard Deviation Worksheet

A small car dealership tests the fuel efficiency of sedans on its lot. It chooses 12 sedans for the test. The fuel efficiency (mpg) values of the cars are given in the table below. Complete the table as directed below.

| **Fuel Efficiency (miles per gallon)** | 29 | 35 | 24 | 25 | 21 | 21 | 18 | 28 | 31 | 26 | 26 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Deviation from the Mean** | | | | | | | | | | | | |
| **Squared Deviation from the Mean** | | | | | | | | | | | | |

a) Calculate the mean fuel efficiency for these cars.

b) Calculate the deviations from the mean, and write your answers in the second row of the table.

c) Write the squared deviations in the third row of the table.

d) Find the sum of the squared deviations.

e) What is the value of $n$ for this data set? Divide the sum of the squared deviations by $n - 1$.

f) Take the square root of your answer to part (e) to find the standard deviation of the fuel efficiencies of these cars. Round your answer to the nearest hundredth.

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| Fuel Efficiency (miles per gallon) | 29 | 35 | 24 | 25 | 21 | 21 | 18 | 28 | 31 | 26 | 26 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Deviation from the Mean | 3.5 | 9.5 | −1.5 | −0.5 | −4.5 | −4.5 | −7.5 | 2.5 | 5.5 | 0.5 | 0.5 | −3.5 |
| Squared Deviation from the Mean | 12.25 | 90.25 | 2.25 | 0.25 | 20.25 | 20.25 | 56.25 | 6.25 | 30.25 | 0.25 | 0.25 | 12.25 |

a) Calculate the mean fuel efficiency for these cars.

Mean =**2255.55**

b) Calculate the deviations from the mean, and write your answers in the second row of the table.

*See table above.*

c) Write the squared deviations in the third row of the table.

*See table above.*

d) Find the sum of the squared deviations.

*The sum of the squared deviations is* ***225511****.*

e) What is the value of $n$ for this data set? Divide the sum of the squared deviations by $n - 1$.

$$n = 12$$

$\frac{251}{11} = 22.818$, to the nearest thousandth

f) Take the square root of your answer to part (e) to find the standard deviation of the fuel efficiencies of these cars. Round your answer to the nearest hundredth.

$$\sqrt{22.818} = 4.78$$

*The standard deviation of the fuel efficiencies of these cars is* $4.78$ *miles per gallon*