Week 3

Absolute/Relative Change

MA123: Mathematical Reasoning & Modeling
(Spring 2021)

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Absolute/Relative Change

Absolute change refers to the simple difference in the indicator over two periods in time, i.e.

$$\text{Absolute change} = \text{Value of indicator in period 2} - \text{Value of indicator in period 1}$$

Relative change expresses the absolute change as a percentage of the value of the indicator in the earlier period, i.e.

$$\text{Relative change} = \frac{\text{Value of indicator in period 2} - \text{Value of indicator in period 1}}{\text{Value of indicator in period 1}} \times 100\%$$

9,800 workers were made redundant (i.e. retrenched or prematurely released from their contracts) in 2010, compared with 23,430 in 2009.

$$\text{Absolute change in number of workers made redundant} = 9{,}800 - 23{,}430 = -13{,}630$$

$$\text{Relative change in number of workers made redundant} = \frac{9{,}800 - 23{,}430}{23{,}430} \times 100\% = -58.2\%$$

Absolute/Relative Change

Try This

The U.S. Weather Bureau has a station on Mauna Loa in Hawaii that has measured carbon dioxide levels since 1959. At that time, there were 315 parts per million of carbon dioxide in the atmosphere. In 2005, the figure was 376 parts per million.

What is the absolute change in carbon dioxide levels: 61 parts per million

What is the relative change in carbon dioxide levels: 19.4% % (Give your answer as a percent between 0 and 100, not a decimal between 0 and 1. Round to ONE decimal place.)

Absolute/Relative Change

Try This

Recently, Washington state instituted "historic" tuition cutbacks that set it apart from most of the rest of the U.S. [Source] Tuition in 2014/2015 was $3,217 in community colleges and was set to be $3,056 in 2015/2016.

What is the absolute change in tuition? -161 dollars (Don't forget to include a negative sign, if appropriate.)

What is the relative change in tuition? -5% % (Give your answer as a percent between 0 and 100, not a decimal between 0 and 1. Round to ONE decimal place and include a negative sign if appropriate.)

Absolute/Relative Change

Try This

Actual and Relative Change

The value of a car dropped from $22,800 to $21,100 over the last year. Determine the absolute and relative change in this sitation.

Absolute Change: This car's value decreased by $ 1700 last year.

Round your answer to the nearest dollar.

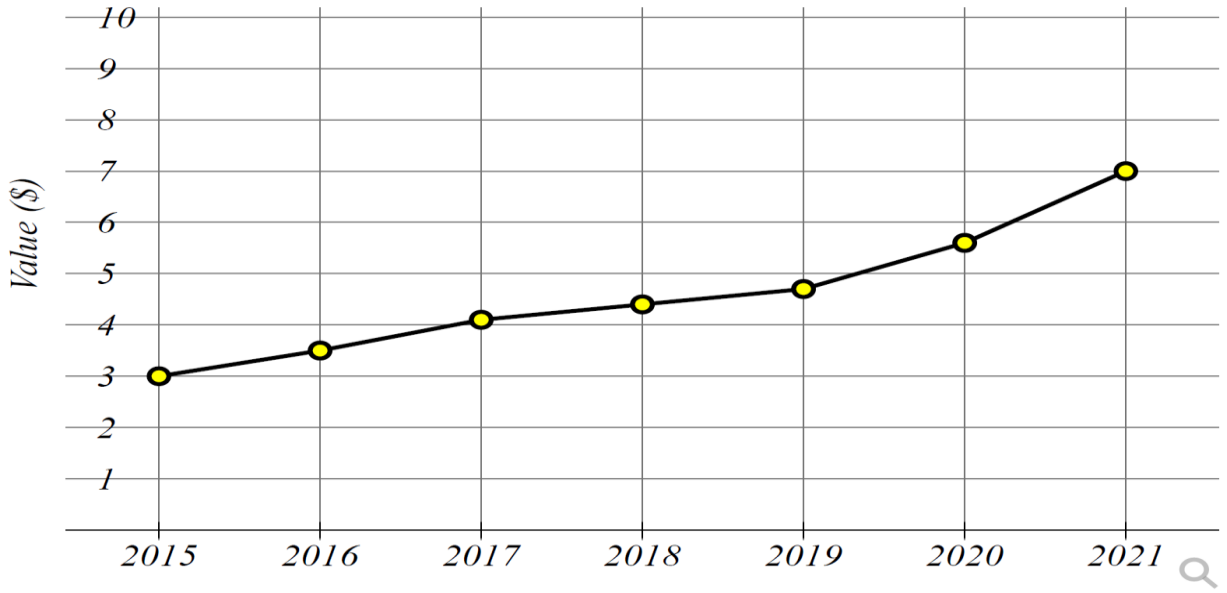
Relative Change: This car's value decreased by 7.5% last year.

Round your answer to the nearest tenth of a percent.

Absolute/Relative Change

Try This

Kilie is an avid collector of action figures based on superhero movies. She has been tracking the value of one of her items for several years, shown in the line graph below.



Determine the absolute and relative change in the item's value from 2015 to 2021 based on the graph, and use those to complete this statement, rounding each value to 1 decimal place.

From 2015 to 2021, the value increased by $ 4 . This is about a 133.3 % increase.

Absolute/Relative Change

Try This

In 1936, the cost of a Hershey's chocolate bar was 5 cents. In 1980, the cost of a Hershey's chocolate bar was 25 cents. By comparison, the CPI-U in 1936 was 13.9, and the CPI-U in 1980 was 82.4. (Remember that the Consumer Price Index for Urban consumers (CPI-U) shows how the prices for goods and services change over time for people living in cities.)
From 1936 to 1980, how did the price of the Hershey bar change compare to the change in CPI-U?
Be sure to include the **relative** increase of each in your answer.

Year	Cost of a Hershey Bar (in Cents)	CPI–U (Consumer Price Index for Urban Consumers)
1936	5	13.9
1980	25	82.4

Explanation: The relative increase in a Hershey's bar was 400%, and the relative increase in CPI-U was 493% during this time period. So the price of a Hershey's bar did not increase asmuch as other goods.