### Regression: calculation and interpretation

**STATISTICS**

12

**Athletics: the men’s 1,500 meters**



The race of the 1,500 m smooth is currently the star test of middle-distance athletics.

The men's modality is part of the modern Olympic Games since its first edition, which took place in Athens in 1896. In that edition the Australian Edwin Flack won, who obtained a record of 4 '33.2' '.

The feminine modality was not recognized until the Olympics of the year 1972, in which the Soviet winner Lyudmila Bragina was victorious, with a time of 4 '01.38 ".

The athlete who won this event in the Olympic Games, held in Brazil, in 2016, was the American Matthew Centrowitz, with a time of 3 '50' '.

Currently, the world record is held by the Moroccan Hicham El Guerrouj, who obtained in Rome, in June 1988, the extraordinary mark of 3 '26.17 ".

The table that we present below shows the Olympic marks of the race of 1 500 m men from Athens 1896 to Rio 2016:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Year | **Time (min.)** | Year | **Time (min.)** | Year | **Time (min.)** |
| 1896 | 4.553 | 1948 | 3.83 | 1988 | 3.599 |
| 1900 | 4.103 | 1952 | 3.752 | 1992 | 3.678 |
| 1904 | 4.09 | 1956 | 3.687 | 1996 | 3.596 |
| 1908 | 4.057 | 1960 | 3.593 | 2000 | 3.535 |
| 1912 | 3.947 | 1964 | 3.635 | 2004 | 3.570 |
| 1920 | 4.03 | 1968 | 3.582 | 2008 | 3.549 |
| 1924 | 3.893 | 1972 | 3.605 | 2012 | 3.569 |
| 1928 | 3.887 | 1976 | 3.653 | 2016 | 3.833 |
| 1932 | 3.853 | 1980 | 3.64 |  |  |
| 1936 | 3.797 | 1984 | 3.542 |  |  |

Draw a point diagram that represents the information.



**1**

Do you think the data show a linear trend? Justify your answer.



**2**

Draw a line representing the point cloud. Do you know what this straight line is called?



**3**



**4**



**5**

Get with the help of the calculator the analytical expression of the previous line.

In what years were not Olympiads celebrated? You know why?

Could you predict the marks of the missing Olympic years? Explain how you would do it.



**6**

Do you think it is reasonable to use the regression line to estimate the brand in the Olympic Games of 2048?



**7**

Why?

And for those of the 2200? Why?



**8**

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