Answer on question 36244 – Math – Statistics and Probability

Calculate the standard deviation of the mark 2,3,6,2,5,0,2.

Solution

For a finite set of numbers, the standard deviation is found by taking the square root of the average of the squared differences of the values from their average value.

The mean for this data is

$$\frac{2+3+6+2+5+0+2}{7} = \frac{20}{7}$$

First, calculate the difference of each data point from the mean, and square the result of each:

$$\left(2-\frac{20}{7}\right)^2 = \left(-\frac{6}{7}\right)^2 = \frac{36}{49}$$

$$\left(3-\frac{20}{7}\right)^2 = \left(\frac{1}{7}\right)^2 = \frac{1}{49}$$

$$\left(6-\frac{20}{7}\right)^2 = \left(\frac{22}{7}\right)^2 = \frac{484}{49}$$

$$\left(2-\frac{20}{7}\right)^2 = \left(-\frac{6}{7}\right)^2 = \frac{36}{49}$$

$$\left(5-\frac{20}{7}\right)^2 = \left(\frac{15}{7}\right)^2 = \frac{225}{49}$$

$$\left(0-\frac{20}{7}\right)^2 = \left(\frac{20}{7}\right)^2 = \frac{400}{49}$$

$$\left(2-\frac{20}{7}\right)^2 = \left(-\frac{6}{7}\right)^2 = \frac{36}{49}$$

Next, calculate the mean of these values, and take the square root:

$$\sqrt{\frac{\frac{36}{49}+\frac{1}{49}+\frac{484}{49}+\frac{36}{49}+\frac{225}{49}+\frac{400}{49}+\frac{36}{49}}{7}} = \sqrt{\frac{174}{49}} = \frac{\sqrt{174}}{7} \approx 1.88.$$

Answer: 1.88.