In a study on survival time for ten patients following a new treatment for AIDS. The time in months were given thus: 24, 12, 8, 20, 3, 18, 24, 25,and 27. Determine the variance for the given data.

**Solution**

The variance of any given set of data containing n values can be calculated as:

$$V = \frac{[(x_1 - x)^2 + (x_2 - x)^2 + (x_3 - x)^2 + \ldots + (x_n - x)^2]}{n}$$

Where:

$x, x_2, x_3 \ldots x_n$ represent the n values, and

$$x = mean\ of\ n\ values = \frac{x_1 + x_2 + x_3 + \ldots + x_n}{n}$$

From the given values we calculate the mean x as:

$$x = \frac{24 + 12 + 8 + 20 + 3 + 18 + 24 + 25 + 27}{9} = 17.9$$

And

$(x_1 - x)^2 = (24 - 17.9)^2 = 37.21;\ (x_2 - x)^2 = (12 - 17.9)^2 = 34.81$

$(x_3 - x)^2 = (8 - 17.9)^2 = 98.01\ ;\ (x_4 - x)^2 = (20 - 17.9)^2 = 4.41$

$(x_5 - x)^2 = (3 - 17.9)^2 = 222.01;\ (x_6 - x)^2 = (18 - 17.9)^2 = 0.01$

$(x_7 - x)^2 = (24 - 17.9)^2 = 37.21;\ (x_8 - x)^2 = (25 - 17.9)^2 = 50.41$

$(x_9 - x)^2 = (27 - 17.9)^2 = 82.81$

And

$$V = \frac{[(x_1 - x)^2 + (x_2 - x)^2 + (x_3 - x)^2 + \ldots + (x_9 - x)^2]}{9}$$

$$V = \frac{37.21 + 34.81 + 98.01 + 4.41 + 222.01 + 0.01 + 37.21 + 50.41 + 82.81}{9} = 63$$

**Answer: 63.**