The scores of 5 students in an examination are: 6, 5, 8, 7 and 4. Find the variance.
a. 3 b. 2 c. 2.5 d. 4.5

Solution

The formula for measuring an unbiased estimate of the population variance from a fixed sample of n observations is the following:

$$s^2 = \frac{\sum_1^n (x_i - \bar{x})^2}{n-1}$$

where

s^2 = Variance

Σ = Summation, which means the sum of every term in the equation after the summation sign.

x_i = Sample observation. This represents every term in the set.

$\bar{x}$ = The mean. This represents the average of all the numbers in the set.

n = The sample size. You can think of this as the number of terms in the set.

In our case

$$\bar{x} = \frac{6+5+8+7+4}{5} = 6$$

and

$$s^2 = \frac{(6-6)^2 + (5-6)^2 + (8-6)^2 + (7-6)^2 + (4-6)^2}{5-1} = \frac{0^2 + 1^2 + 2^2 + 1^2 + 2^2}{4}$$
$$= \frac{0+1+4+1+4}{4} = 2.5$$

Answer: c. 2.5.