

Answer on Question #63554 – Math – Statistics and Probability Question

The height of 40 students were measured and recorded as follows:

38.7 40.2 55.4 60.9 70.1 72.5 50.4 63.7
 39.4 54.6 59.3 60.2 45.1 66.5 37.9 74.2
 44.5 59.6 55.2 60.7 68.0 70.0 71.2 48.3
 49.4 54.4 60.9 64.7 69.3 57.4 46.2 68.9
 55.3 70.2 71.7 63.2 55.4 39.0 40.3 44.5

Using classes of 35-39, 40-44, - - - calculate;

- i. The arithmetic mean
- ii. The standard deviation

Solution

- i. The arithmetic mean

There are 8 classes:

Class	Midpoint (x)	Frequency (f)	f*x
35-39	37	4	148
40-44	42	4	168
45-49	47	4	188
50-54	52	3	156
55-59	57	7	399
60-64	62	7	434
65-69	67	4	268
70-74	72	7	504
Totals		$\sum f = 40$	$\sum fd = 2265$

Arithmetic mean = $\frac{\sum fx}{\sum f} = \frac{2265}{40} = 56.6$.

- ii. Standard deviation

Class	Midpoint (x)	Frequency (f)	f * x	f(x - \bar{x}) ²
35-39	37	4	148	1540,563
40-44	42	4	168	855,5625
45-49	47	4	188	370,5625
50-54	52	3	156	64,17188
55-59	57	7	399	0,984375
60-64	62	7	434	202,2344
65-69	67	4	268	430,5625
70-74	72	7	504	1654,734
Totals		$\sum f = 40$	$\sum fd = 2265$	5119,37

$\bar{x} = 56.6$

$$\text{Standard deviation} = s = \sqrt{\frac{f(x-\bar{x})^2}{n-1}} = \sqrt{\frac{5199.37}{40-1}} \approx 11.54$$

Standard deviation is 11.54.

Answer: **i.** The arithmetic mean is 56.6.

ii. The standard deviation is 11.54.