

Answer Key: Dispersion and Variability

- 1.) Sample variance always underestimates the population parameter. This is bias. To correct for bias, the formula for sample variance has $n-1$ in the denominator. This increases the result. The formula for population variance has N in the denominator.
- 2.) Your answer
- 3.) Standard deviation is the average distance of all scores from the mean. When we calculate sample standard deviation (s.d.) we are estimating the population s.d. Variance is average squared deviations from all scores to the mean.
- 4.) Your answer

5.) $\sum X = 112$ $N=10$ $\text{mean} = \frac{112}{10} = 11.2$ days

$17 - 7 = 10$ days (range)

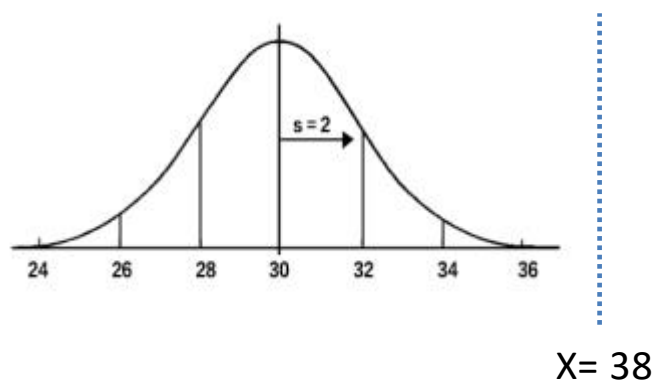
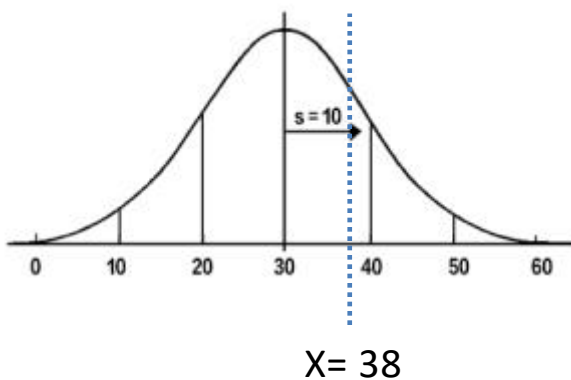
$\sum X = 112$ $\sum X^2 = 1330$ $N = 10$ $SS = 75.6$

$S^2 = 8.4$ $S = 2.9$

- 6.) Your answer

- 7.) 38 is less than 1 sd above the mean

38 is farthest from the mean when $S=2$.
It is 4 sd away!



8.) Your answer

9.) Keep in mind that the curve below is not drawn to scale. Standard deviation units ($s=2.0$) indicated in blue.

