

Solutions

Each answer shows the steps, then the **result**.

2.1

- when the data cannot be assumed to be normally distributed

2.2

- $\sim B(n, 0.5)$

3.1 B

- The signed-rank test also uses the ranks (sizes) of the differences

3.2

(a)

- H_0 : median difference = 0 (no change); H_1 : median difference > 0 (improvement)

(b)

- $P(X \geq 8) = P(8) + P(9) + P(10) = \frac{45 + 10 + 1}{1024} = \frac{56}{1024} = 0.0547$; $0.0547 > 0.05$, so do not reject H_0 — insufficient evidence of improvement

3.3

- a t-test assumes the population is normal; for a small sample that assumption cannot be checked reliably; a non-parametric test makes no such assumption, so it is safer when normality is doubtful