Solutions

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

2.1

- $H_0 : \mu = \mu_0$

2.2

- $t = \dfrac{\bar{x} - \mu_0}{s/\sqrt{n}}$

2.3

- $t = \dfrac{52 - 50}{8/\sqrt{16}} = \dfrac{2}{2} = 1.0$

3.1 A

- $\dfrac{\bar{x} - \mu_0}{s/\sqrt{n}}$.

3.2 B

- $n - 1$.

3.3

(a)

- $H_0 : \mu = 100$

(b)

- $t = \dfrac{104 - 100}{10/\sqrt{25}} = \dfrac{4}{2} = 2.0$

(c)

- 24

3.4

(a)

- each employee is measured twice, so the before and after scores are paired, not independent samples
- $H_0 : \mu_{\text{diff}} = 0$, $H_a : \mu_{\text{diff}} > 0$, where μ_{diff} is the true mean increase in words per minute (after − before)

(b)

- $n = 8 < 30$, so the sampling distribution of $\bar{x}_{\text{diff}}$ is approximately normal only if the population of differences is roughly normal; no outliers or strong skew in the sample supports this

(c)

- one-sample t statistic on the differences:

$$t = \frac{\bar{x}_{\text{diff}} - 0}{s_{\text{diff}}/\sqrt{n}} = \frac{3.5 - 0}{4.2/\sqrt{8}} = \frac{3.5}{1.485}$$

- $t = \mathbf{2.36}$, with $\text{df} = n - 1 = \mathbf{7}$