

## ANSWER KEY

1. D 2. E 3. B 4. C 5. E 6. B 7. E 8. D 9. D 10. C

### 11. Housing costs

- a. The government report uses a large sample size.      b.  $t_{49}(235700, 3606.24)$   
c. No, this county's mean home price could be the same as the national average because \$235,700 is in the confidence interval.  
d.  $ME = t_{n-1}^* \times SE(\bar{y})$  or  $2000 = (1.676) \left( \frac{25500}{\sqrt{n}} \right)$  or  $\sqrt{n} = 21.369$  or  $n = 456.6$

We need to sample approximately 457 home prices. (Or 440 using  $z^* = 1.645$ )

### 12. Gas mileage

$P = 0.0041$  is strong evidence that the gas mileage of automobiles coming off the assembly line after the manufacturing adjustment has been increased. We are 95% confident that the mean gas mileage has increased between 0.74 and 4.45 miles per gallon.

### 13. Test identification

	Type	z/t?	df
a.	1	z	n/a
b.	3	t	23
c.	2	z	n/a
d.	5	t	14
e.	5	t	9
f.	4	t	Technology

### 14. Improving productivity

- a.  $H_0 : \mu_d = 10$   $H_A : \mu_d > 10$   
b. A Type I error would be very expensive for the packing company. A Type I error would mean that the manager rejected the null hypothesis when in fact the null hypothesis is true. In this situation, by rejecting the null hypothesis the company thought the training improved productivity, so they paid for the consultant to train all employees. In reality, the training did not improve productivity so the company wasted money on training that did not help.  
c. To increase the power of the test, we could increase the level of significance ( $\alpha$ ), or increase the sample size. Increasing the level of significance, could lead to adopting a training method that actually does not improve productivity. By increasing the sample size, the trial cost would increase and the trial might take more time.

### 15. Flight costs

The inference procedure to use would be the  $t$ -test for the difference of means.

- \* Independent groups: costs from east and west should be independent.
- \* Randomization: The sample of the expense vouchers was randomly selected.
- \* 10% condition: There were more than 100 readers in Lincoln, Nebraska from both east and west, so a sample of 10 is less than 10% of all readers in Lincoln.
- \* Nearly Normal condition: The airline ticket costs from the east are roughly symmetric, but the airline ticket costs from the west are very skewed. We cannot satisfy this condition, so we cannot proceed with the test.