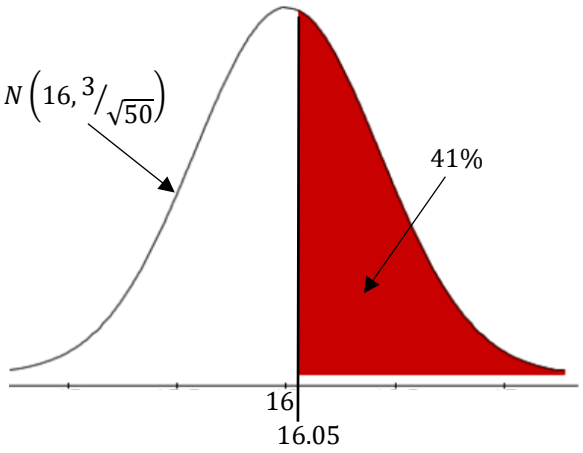
1. C
2. A
3. C
4. B
5. B
6. B $\left[\int_0^{0.4} 2x dx = 0.4^2\right]$
7. D
8. D
9. D
10. B
11. C
12. D
13. A
14. B
15. D
16. C
17. D
18. D
19. B
20. Note: this is a question about the distribution of the sample average; since $n = 50 > 30$, the CLT holds and we know that the sampling distribution of $\bar{x}$ will be normal!



21. While $np = (50)(0.95) = 47.5$ meets the large sample condition, $n(1-p) = (50)(0.05) = 2.5$ does not. Thus the shape of the sampling distribution of p-hat will not be normal; rather it will be left-skewed. We can say that the center will be 0.95, and the standard deviation will be $\sqrt{\frac{(0.95)(0.05)}{50}} = 0.03$.

22.

a. $30 \pm t_{74} \times \frac{5}{\sqrt{75}}$

b. 90% of possible random samples of 75 homes from this county would produce a 90% confidence interval that contains the true average amount of lawn space allowed for pets.

23.

$$E\left(\widehat{\Theta}\right) = E\left(\frac{n+1}{n}Y\right) = \frac{n+1}{n}E(Y) = \frac{n+1}{n}\frac{n}{n+1}\theta = \theta$$

Since $E\left(\widehat{\Theta}\right) = \theta$, $\widehat{\Theta}$ is unbiased for θ.

24. The group should use method 2. Method 1 is a convenience sample, and convenience samples tend to be biased. Method 2 is a cluster random sample where classes are the clusters. Cluster random samples tend to be unbiased. Since method 1 would likely be biased and method 2 would likely be unbiased, the group should use method 2.

25. $P(X \geq 2) = 1 - P(X < 2) = 1 - \left[\binom{20}{0}(0.06^0)(0.94^{20}) + \binom{20}{1}(0.06^1)(0.94^{19})\right]$

Note: you could solve $P(X \geq 2)$ directly, but this would waste a lot of time!
$P(X \geq 2) = \binom{20}{2}(0.06^2)(0.94^{18}) + \binom{20}{3}(0.06^3)(0.94^{17}) + \cdots + \binom{20}{20}(0.06^{20})(0.94^0)$