

1.
 - a. The shape of the sampling distribution is approximately normal because both population distributions are approximately normal.
 - b. $1,240 - 1,200 = 40$. For many, many pairs of samples of size 15 from High School A and 12 from High School B, the average difference in mean SAT scores is 40.
 - c. 45.134. $15 \leq 10\%$ (all SAT scores from High School A) and $12 \leq 10\%$ (all SAT scores at High School B) are both reasonable.
 - d. $P(\bar{x}_A - \bar{x}_B > 0) = 0.8123$.

2.
 - a. No. The population is skewed left. The highest number of attempts is 6, so there must have been many players that took 5 and 6 attempts and only a few players that took 4 or fewer in order for the average to equal 5.82 attempts.
 - b. Shape: approximately normal according to the central limit theorem because $32 \geq 30$ and $45 \geq 30$.
 Center: Mean = $5.82 - 5.82 = 0$
 Variability: SD = $\sqrt{\frac{0.56^2}{32} + \frac{0.56^2}{45}} = 0.129$
 - c. 0.0100.
 - d. Yes, it is very unlikely to have a difference of -0.3 or lower just by chance if we assume there is no difference in the mean number of attempts to solve the word JAZZY for both groups.

3.
 - a. Answers may vary; Pratham could have a sample mean of 85.3 and Raghav could have a sample mean of 83.2.
 - b. Raghav found the difference of variances when he should be adding the variances from each sampling distribution. Pratham forgot to square the standard deviations. The correct standard deviation is $\sqrt{\frac{15.2^2}{30} + \frac{17.3^2}{30}} = 4.204$ seconds.
 - c. The probability that the mean from a random sample of 30 of Pratham's times is at least 2.1 seconds greater than the mean from a random sample of 30 of Raghav's times is approximately 0.0995.

4.
 - a. Since we do not know the shape of the population distributions, the sample size for each group must be at least 30.
 - b. In order to use the formula for standard deviation, the 10% condition must be met for each sample. This means $n \leq 10\%(500)$, or $n \leq 50$ for the adults over age 35 and $n \leq 10\%(350)$, or $n \leq 35$ for the adults aged 18 to 24.
 - c. The largest sample possible for the 18 to 24 age group is 35 because of the 10% condition, so they would not be able to use the formula for standard deviation.

5. D

6. A