

The Central Limit Theorem

Math Academy 1 Worksheet 8-B

1. Fill in the blanks.

a) The central limit theorem states that distributions of sample means tend to be _____ and tend to have a standard deviation of _____.

b) The above statement is more valid the larger the _____ is and the closer to _____ the underlying distribution is.

2. Circle which sample would be more likely to turn out as stated, assuming the samples are random.

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|--|-------------------------|---------------------|
| a) Most people have black hair. | a) a classroom | b) a stadium |
| b) Haider makes all of his free throws. | a) one game | b) one month |
| c) Biden gets a favorable rating in a Texas poll. | a) 100 people | b) 200 people |
| d) Fewer than two thirds of nickels land on heads. | a) a handful of nickels | b) a jar of nickels |
| e) More than 40% of 6-sided dice roll higher than 4. | a) 40 dice | b) 60 dice |
| f) Campbell comes out ahead after gambling in Las Vegas. | a) one night | b) one week |

3. Placement exams at Zeng University are approximately normally distributed with a mean of 180 and a standard deviation of 48. Calculate the probability of each of the following for students at ZU. For each problem, sketch a curve and shade the area representing the answer.

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|---|---|
| a) The next person scores over 200 | b) The next 10 people average over 200 |
| c) The next 20 people average between 160 and 200 | d) The next 40 people average between 160 and 200 |