Date Completed: _____
Mentor Initials: _____

Word Problems

1. Adam is baking a pizza, and the original recipe calls for 3 tablespoons of sugar, 1.5 tablespoons of salt, cups of bread flour, and 1.5 ounces of pizza sauce. If Adam is baking multiple pizzas for a large group, and he uses 5 ounces of pizza sauce in total, how many tablespoons of sugar does he use?

A. 12
B. 10
C. 9
D. 8
E. 6

2. Last week, Julian and Jordan opened distinct bank accounts with initial deposits of $\$92.00$ and $\$202.00$, respectively. Every week after opening the accounts, Julian will add $\$22.00$ to his account and Jordan will deduct $\$18.00$ from her account. During which week will the two accounts be of equal value?

A. 2
B. 3
C. 4
D. 5
E. 6

3. Mark is an investor in a new technology that returns 12% annually. If Mark's initial investment was $\$240{,}000.00$, which of the following values is closest to his profit after 4 years?

A. $\$3{,}317{,}000$
B. $\$1{,}075{,}200$
C. $\$960{,}000$
D. $\$377{,}650$
E. $\$137{,}650$

4. How many phone numbers are possible in the United States, using the standard XXX-XXX-XXXX format, given that the first digit cannot be zero?

A. $10!$
B. $9 + 102 + 103 + 104$
C. $3!\ 3!\ 4!$
D. 9×10^9
E. 10^{10}

5. Matilda rode a motorcycle with wheels 36 inches in diameter. During one minute of her ride, the wheels made exactly $1{,}000$ revolutions. At what average speed, in *feet* per *second*, was Matilda riding during that minute?

A. 36π ft/s
B. 42π ft/s
C. 50π ft/s
D. 720π ft/s
E. 7200π ft/s

6. Mrs. Alvarez runs a weekly after-school art studio for inner-city students whose schools do not provide art instruction. Each week, Mrs. Alvarez monitors trends in art practice by polling her students on their preferred mediums. The poll is conducted simply by students raising their hands when a certain medium is called. Last week, 48 students attended Mrs. Alvarez's studio. She recorded 22 students that preferred paints, 18 that preferred charcoals, and 25 that preferred collage. Given that each student participated, which of the following is NOT a possible explanation for the poll?

A. Seventeen students voted twice
B. Four students voted three times and nine students voted twice
C. Four students voted twice and five students voted three times
D. One student voted three times and fifteen students voted twice
E. Seven students voted twice and five students voted three times

7. The rectangular pool behind John's house has a width of 8 yards and a length of 12 yards. John decides to remodel his pool by increasing both the length and width by the same amount. The area of John's new pool is 2 times the area of his original pool. What is the length, in yards, of the new pool?

A. 10
B. 12
C. 14
D. 16
E. 18

8. At a local grocery store, on average, 7 customers are in line when the store closes for the day. The probability, P, that exactly c customers are in line when the store closes can be modeled by the equation $P = \frac{7^c e^{-3}}{(c+2)!}$. Given that $e^{-3} = 0.05$, which of the following values is closest to the probability that exactly 5 customers are in line when the store closes?

A. 0.19
B. 0.17
C. 0.15
D. 0.13
E. 0.07

9. A diner has 12 booths that will seat up to 6 people each. If 34 people are sitting in the booths, and each booth has at least two people, how many booths could possibly be filled with 6 people?

A. 1
B. 2
C. 3
D. 4
E. 5

10. Monica, Leah, and Ellie shared a pizza. Monica ate $\frac{3}{7}$ of the pizza, Leah ate $\frac{1}{4}$ of the pizza, and Ellie ate the rest. What is the ratio of Monica's share to Leah's share to Ellie's share?

A. $12 : 7 : 9$
B. $14 : 4 : 10$
C. $14 : 6 : 8$
D. $6 : 16 : 6$
E. $4 : 7 : 3$

11. Billy has $\$1{,}600.00$ available to buy ACT prep books for his students. Each prep book has a price of $\$22.00$, and Billy will pay sales tax of 9% on each book purchased. If Billy did not have to pay sales tax, how many more ACT prep books could he buy for his students?

A. 12
B. 10
C. 8
D. 6
E. Cannot be determined by the given information.

12. Risa visited Colonial Williamsburg and bought a simple wooden toy used in the 1700's. The toy involves a wooden rod with a wooden ball attached by a string. The object of the toy is to swing the rod, propelling the string and landing the wooden ball on top of the rod. The percent odds of success, S, can be modeled by the equation $S = (\frac{ht^2}{100})$, where h is the height above the ground and t is the time from beginning of swing to the end, in seconds. Risa lent the device to her friends and saw how many attempts they made before succeeding. She recorded her results as follows: $10, 7, 14, 16, 22, 40, 4, 15, 28, 30$. What is the difference between the mean and the median of her results?

A. 2.6
B. 2.8
C. 3.1
D. 3.6
E. 4.4

13. A cylindrical can of root beer is completely filled. It has an inside height of 8 inches and an inside diameter of 3 inches. When Tim pours the root beer from the can into a cylindrical glass with an inside diameter of 2 inches, its height is what percent of its height in the can?

A. 225%
B. 200%
C. 160%
D. 80%
E. 60%

14. The distance, d, an object travels in t minutes can be modeled by the equation $d = \frac{1}{4}at^2$, where a is the acceleration rate, in meters per minute per minute. If a plane accelerates from takeoff at the rate of 60 *meters* per minute and travels $6{,}000$ *kilometers*, about how many minutes did the plane travel?

A. 632
B. 648
C. 726
D. 828
E. 844

15. Jim built a series of giant trapezoids in Dolores Park as part of a government-commissioned public art project. Each trapezoid had a lower base no smaller than 12 feet and no larger than 24 feet. Each trapezoid had an upper base no smaller than 4 feet and no larger than 8 feet. The height of his trapezoids ranged from 6 to 14 feet. Based on the information above, what is the possible range of areas, in feet, for Jim's giant trapezoids?

A. $12 \leq x \leq 96$
B. $32 \leq x \leq 108$
C. $24 \leq x \leq 112$
D. $48 \leq x \leq 112$
E. $48 \leq x \leq 224$

16. Two builders began building at the same time. Builder A's contract called for a base pay of $\$80{,}000$ plus $\$40$ per square foot in the house he built. Builder B's contract called for a base pay of $\$120{,}000$ plus $\$10.00$ per square foot in the house he built. At what square footage would builder A's take-home pay be twice that of Builder B's?

A. $8{,}000$
B. $12{,}000$
C. $18{,}000$
D. $44{,}000$
E. $80{,}000$

17. Catherine is having her church group over for dinner on Thursday evening. She has a circular dining room table 6 feet in diameter that she will need to make a tablecloth for, with the tablecloth extending over the table's edges to at least 4 inches all the way around. To finish the edge of the tablecloth, Catherine will fold under and sew down 2 inches of the material all around the edge of the cloth, which is one-eighth of an inch thick. What is the shortest length of fabric, in inches, Catherine could use to make the tablecloth as one solid piece of fabric?

A. 48
B. 60
C. 72
D. 78
E. 84

18. The manager at Bob's Discount Store announces a special Christmas discount sale: 25% off appliances, 30% off mattresses, 40% off couches, and 70% off art. James decides to buy a $\$400.00$ refrigerator, a $\$440.00$ mattress, a $\$640.00$ couch, and a $\$940.00$ painting. Which item is the LEAST expensive following the application of the discounts?

A. Refrigerator
B. Mattress
C. Couch
D. Painting
E. None of the above

19. Sheila stands in a field. She stares directly at Mt. Lucas, which her GPS says is 1.4 miles away. Off to her northeast, she can see the peak of Mt. Josh, which her GPS tells her is 2.2 miles away. Assuming the straight line distance between Mt. Lucas and Mt. Josh forms a perpendicular line with Sheila's line-of-sight to Mt. Lucas, what is the approximate distance, in miles, between Mt. Lucas and Mt. Josh?

A. 1.64
B. 1.70
C. 1.74
D. 1.78
E. 1.82

20. Adam decides to cover his rectangular wood patio with foam blocks so that his children don't get hurt running around. The patio measures 12 feet by 14 feet. The foam blocks are each 8 inches by 6 inches by 4 inches. What is the minimum number of foam blocks Adam will need if each block faces the same direction?

A. 4
B. 42
C. 84
D. 126
E. 504