

Round A (3 points each)

A

1. Evaluate the following expression: $\left[(15 + (6 - 19)(30))(27 - 6(3 + 2)) \right](-8 + 2(4))$
2. While chopping wood, the Tin Woodman got caught in the rain and rusted. He was frozen in place for exactly 25 days before Dorothy found him and used his oil can to save him. For how many hours was the Tin Woodman unable to move?
3. When rolling a standard six-sided die, what is the probability of rolling a number that is both even and prime? Express your answer as a reduced fraction.

Round B (4 points each)

B

4. How many whole numbers are between $\frac{7}{5}$ and 2π ?
5. Dr. No has \$63 dollars, Mr. Big has \$2 more than Le Chiffre, and Le Chiffre has one-third as much as Dr. No. How many dollars do the three villains have in all?
6. Jason is making a golf trophy. He has to paint 300 dimples on a golf ball. If it takes him 2 seconds to paint one dimple, how many minutes will he need to do his job?

Round C (5 points each)

C

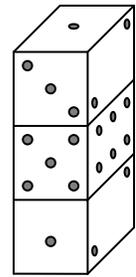
7. The Randolph basketball team attempted eight three-point shots, twenty-two two-point shots, and sixteen free throws (worth one point each). If they made 25% of their three point attempts, 50% of their two point attempts, and 75% of their free throws attempts, how many points did they score?
8. A rectangular garden 50 feet long and 10 feet wide is enclosed by a fence. To make the garden larger, while using the same fence, its shape is changed to a square. By how many square feet does this enlarge the garden?
9. A collector offers to buy state quarters for 2000% of their face value. If she sells to that collector, how many cents will Brandy get for her eight state quarters?

Round D (6 points each)

D

- In Roxanne's class of 48 students, 29 have brown eyes, and 7 have blue eyes. Two thirds of the remaining students have green eyes, while the rest have hazel eyes. Roxanne makes a pie graph to represent this data. How many degrees should she use for the piece representing green eyes?
- During each complete cycle of a traffic light, the light is green for 25 seconds, yellow for 5 seconds, and red for 30 seconds. At a randomly chosen time, what is the probability that the light will not be green? Express your answer as a fraction.
- What is the smallest possible product of three different numbers selected from the following list: $-11, -5, -2, 0, 4, 6, 9$?

Round E (7 points each)



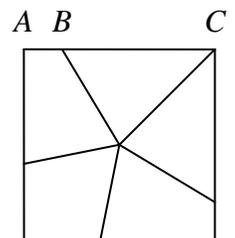
E

- The diagram to the right show three standard dice stacked one on top of the other. There are dots that are not visible because they are on the bottom, left, or back of the stack, or because they are between pairs of dice. In all, how many dots are not visible?
- Sridhar has 43 coins that add up to a dollar. He has exactly four different kinds of coins. How many pennies does Sridhar have?
- In a math contest with 50 problems, 5 points were awarded for correct answers and two points were subtracted for incorrect answers. Brooke answered every question and got a score of 159. How many problems did she answer correctly?

Round F (8 points each)

F

- The number 84 has the property that it is divisible by its ones digit. How many whole numbers between 10 and 70 also have this property?
- The picture to the right depicts a square cake as viewed from above. The cake is frosted on the top and on each of the four sides. Kathy made five cuts, as shown, each of which connected the center of the cake to the edge. As a result, each of the pieces had the same volume and the same amount of frosting. If the side length of the cake is 8 inches, find the length in inches of BC. Express your answer as a mixed number.



- What is the largest whole number n such that 2^n evenly divides into $16!$?

Round G (9 points each)

G

19. Varun flips one dime while Neelesh flips two nickels. What is the probability that both end up with the same number of heads? Express your answer as a fraction.
20. Katelyn and Matthew were once the same height. Since then, Katelyn has grown 20% taller while Matthew has grown only half as many inches as Katelyn. Katelyn is now 60 inches tall. What is Matthew's height in inches?
21. Evaluate the following expression. $\frac{1}{100} \times \frac{2}{99} \times \frac{3}{98} \times \dots \times \frac{97}{4} \times \frac{98}{3} \times \frac{99}{2}$.
Write your answer as a decimal to the nearest hundredth.

Round H (10 points each)

H

22. The strip of paper shown below is folded so that the right half of the strip ends up on top of the left half. It is folded twice more in the same way, so that each time the right half ends up on top of the left half. After this procedure, the strip of paper is exactly as wide as one square. At this point, what is the sum of the numbers that are BELOW the 6?

1	2	3	4	5	6	7	8
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23. In the addition problem to the right, every letter represents a digit from 0 to 9. Different letters represent different digits, but every occurrence of the same letter represents the same digit. For example, if T represents 0 in the first number, then it represents 0 in each of the other numbers as well. What number is represented by SIXTY?

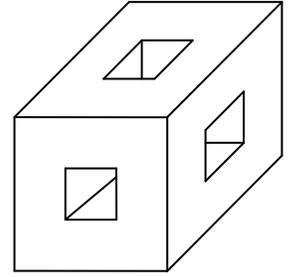
$$\begin{array}{r} \text{F O R T Y} \\ \text{T E N} \\ + \text{T E N} \\ \hline \text{S I X T Y} \end{array}$$

24. A notebook contains the following one hundred sentences:
"This notebook contains exactly one false sentence."
"This notebook contains exactly two false sentences."
"This notebook contains exactly three false sentences."
... and so on until ...
"This notebook contains exactly one hundred false sentences."
How many false sentences are in the notebook?

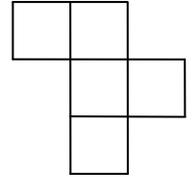
Round I (11 points each)

I

25. The diagram to the right shows a $9 \times 9 \times 9$ cube that has been “cored.” A cube of side length 3 was removed from the center of each face of the original large cube, and another identical cube was removed from the center of the original large cube. What is the surface area of the cored cube?



26. A “pentomino” is a connected planar figure, like the one to the right, that consists of five unit squares that share edges. There are exactly 12 different pentominoes that can be drawn, if reflections and rotations are allowed. How many of the twelve have at least one line of symmetry?



27. The Pizza π Restaurant sells three types of pizza slices: Veggie, Meat, and Cheese. Somil wants to buy four slices. How many different combinations can he select?

Round J (12 points each)

J

28. There are exactly 24 four-digit numbers that can be made using each of the digits 2, 4, 5, and 7 exactly once. Exactly one of these 24 numbers, call it N , is equal to a multiple of one of the other 24 numbers. What is the value of N ?
29. A cloth bag contains 3 blue marbles and 2 green marbles. Marbles are randomly drawn out one at a time without replacement until all the blue marbles have been drawn or all the green marbles have been drawn, at which point the drawing stops. What is the probability that the last marble drawn is green?
30. Your answer for this problem should be a number between 0 and 20 that you think will be exactly two away from the average of all the answers submitted to this problem. If x is the number you submit, and y is the actual average, your score will be $\frac{12}{1 + |2 - |x - y||}$, rounded to the nearest whole number.