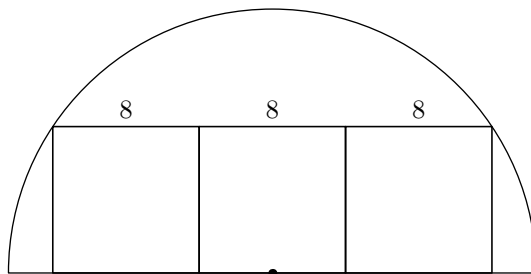


MNYMO
August 22, 2026
Team

You have 20 minutes to complete 10 problems. There is no penalty for guessing. Answers are only valid if they are written in the below table.

First and last name			
p	Answer	p	Answer
1		6	
2		7	
3		8	
4		9	
5		10	

1. A semicircle circumscribes 3 adjacent squares of side length 8 as shown in the diagram below. Find the area of the semicircle.



2. Alice, Bob, and Carol want to paint a house in exactly one hour. If Alice and Bob work together to paint the house, they could finish it in 3 hours. If Alice and Carol work together, they could finish it in 4.5 hours. If Bob and Carol work together, they could finish it in 6 hours.

Unfortunately, Alice, Bob, and Carol are way too slow to paint the house in only one hour, so Carol recruits some friends who paint at the exact same rate as her. How many friends must Carol recruit so that they can finish the house in one hour?

3. Call an arithmetic sequence of primes *banned term* if it has common difference 6. Find the maximum possible length of a banned term sequence of primes.
4. In the 3×3 grid below, place nonzero digits in each cell such that the three-digit numbers formed by reading each row right-to-left and each column top-to-bottom conform to the following rules:
 - Row 1: A square Fibonacci number
 - Row 2: A perfect cube
 - Row 3: A number with strictly decreasing digits
 - Column 1: An odd composite number
 - Column 2: A multiple of 37
 - Column 3: A multiple of Row 1

Compute the sum of the three-digit numbers formed by the rows.

	COL 1	COL 2	COL 3
Row 1			
Row 2			
Row 3			

5. You're playing a game that involves repeatedly rolling a fair 12-sided die that has the integers from 1 to 12 on it. You start with zero points, and on each turn you may either roll the dice, or end the game. If you roll a 6 or a 7, your score becomes 0 and the game ends. Otherwise, the number you roll is added to your score. To maximize the expected value of your score, there exists an integer N for which you should always roll again if your score is less than or equal to N , but always should stop rolling if your score is more than N . Compute N .

6. Let $ABCDEF$ be a regular hexagon. Let G lie on line segment AE such that $AG = EG$. Let H lie on line segment AF such that $2AH = FH$. Let K lie on line segment BE such that $3EK = BK$. Find the ratio of the area of $ABKGH$ to the area of $ABCDEF$.
7. Calculate the number of ways to rearrange the letters in the name $WASHINGTON$ such that no vowel is adjacent to another vowel and all consonants are adjacent to another consonant.
8. Let $z = 2(\cos 40^\circ + i \sin 40^\circ)$, and let $\omega = z - z^7$. Determine the value of $|\omega|^2$.
9. Square $ABCD$ has vertices A , B , and C lying on the perimeter of rectangle $PQRS$ with $PQ = 7$ and $QR = 11$. Find the largest possible area of $ABCD$.
10. Integers a , b , c , and d satisfy the equations $a^{(b^{(c^d)})} = 27$ and $abcd = -54$. Find the sum of all possible values of $a + b + c + d$.