

α Alpha Round

AMSA-MAMS Pi Day Mathematics Tournament

March 9, 2019

1. Simplify $\sqrt{3^3 + 6(3^2)}$
2. It takes 7 Pokeman raisers 3 minutes to raise a Pokeman's stage 4 times. How many Pokeman raisers are needed to raise a Pokeman's stage 314 times within 1 hour?
3. Five students take a test. Four of the scores are 75, 85, 95, and 72. If the average score is 80, what is the score of the last student?
4. Thomas has a 5 mL mixture of 50% water and 50% soda. How much water must he add to get a mixture of 25% soda?
5. In a circular arc AOB of measure 60° , with $AO = BO = 4$, what is the area of the sector between \widehat{AB} and AB (see Figure (a))?
6. In Figure (b), $AC = 8$, $AD = 3$, $ED = 4$, and $ED \parallel CB$. Find BC
7. Given Max has 4 random pieces of pie, each of which are either apple, pecan, or, blueberry flavored, what is the probability that Max can enjoy at least 2 slices of different flavors?
8. The number $10^{10} - n$, for some integer n , is divisible by 7. What is the minimum value of n ?
9. There are 2 chairs in the front row of a theater. Each row of chairs has two times one more than the number of chairs of the row in front of it. If there are 10 rows in the theater, how many chairs are there in the theater in total?
10. Jack and Jill are playing a competitive game. Each round, each player decides to say either 1 or 2 simultaneously. Let the sum of the numbers that round be a . If a is even, Jack gets a points and Jill gets $-a$ points. But if a is odd, Jack gets $-a$ points and Jill gets a points. If Jack and Jill play for 100 rounds, what is the expected value of Jack's score (assuming both players play optimally).

