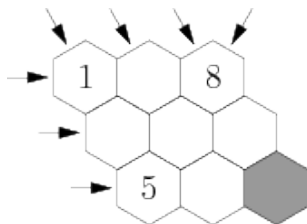


- The average of 17 consecutive integers is 45. What is the largest of the integers?
(A) 49 (B) 53 (C) 56 (D) 61 (E) 62
- The ages of a son and his dad add up to 56. Four years ago the dad was 3 times older than his son. What is the father's age?
(A) 34 (B) 37 (C) 40 (D) 43 (E) 46
- What is the last digit of the number 17^{2009} ?
(A) 1 (B) 3 (C) 5 (D) 7 (E) 9
- Let $2x + 3y = 72$. How many ordered pairs (x, y) , where x and y are nonnegative integers, will satisfy the equation?
(A) 7 (B) 9 (C) 11 (D) 13 (E) 15
- The digits 1 through 9 are placed in the hexagonal array so that all seven lines of 3 adjacent hexagons have the same sum. Each digit is used once. What number goes in the shaded hexagon?



- (A) 2 (B) 3 (C) 4 (D) 6 (E) 7
- How many positive divisors does 2009 have?
(A) 3 (B) 4 (C) 5 (D) 6 (E) 7
- A circle with radius 1 is tangent to sides AB , AD , and CD of rectangle $ABCD$ and passes through the midpoint of diagonal AC . What is the area of the rectangle $ABCD$?
(A) 4 (B) 6 (C) 8 (D) 10 (E) 12
- What is the largest of the following numbers: 2^{50} , 3^{35} , 4^{30} , 5^{25} , 6^{20} ?
(A) 2^{50} (B) 3^{35} (C) 4^{30} (D) 5^{25} (E) 6^{20}
- Let x, y be real numbers such that $y > 5$ and $x - y + 1 = 0$. Determine the value of the expression $\sqrt{4x^2 + 4y - 3} - 2\sqrt{y^2 - 6x - 2y + 10}$.
(A) 1 (B) $\sqrt{2}$ (C) 5 (D) $4\sqrt{3}$ (E) 7
- How many positive integers are equal to three times their sum of digits?
(A) None (B) 1 (C) 2 (D) 3 (E) 4 or more
- An integer between 5 and 950 inclusive is selected at random and is found to be a perfect cube. What is the probability that it is also a perfect square?
(A) $1/4$ (B) $1/6$ (C) $1/8$ (D) $3/14$ (E) $5/44$

12. The pages of a book are numbered 1 through n . When the page numbers of the book were added, one of the page numbers was mistakenly added twice, resulting in an incorrect sum of 2009. What was the number of the page that was added twice?

(A) 54 (B) 55 (C) 56 (D) 57 (E) 58

13. Find the volume of a rectangular box if the areas of three of the faces are 4, 82, and 2009.

(A) 2009 (B) $574\sqrt{2}$ (C) $82\sqrt{14}$ (D) $82\sqrt{2}$ (E) 328

14. What is the value of the sum

$$\frac{1}{1 \cdot 3} + \frac{1}{3 \cdot 5} + \frac{1}{5 \cdot 7} + \frac{1}{7 \cdot 9} + \cdots + \frac{1}{199 \cdot 201} ?$$

(A) $2/5$ (B) $100/201$ (C) $50/101$ (D) $3/7$ (E) $1/2$

15. A point A is 9 units from the center O of a circle of radius 15. How many different chords of the circle pass through A and have integer lengths?

(A) 0 (B) 2 (C) 6 (D) 12 (E) infinitely many

1. If the sum of two numbers is 12 and their product is 30, then find the sum of their reciprocals.
2. Find the integer n such that the number $\sqrt{\frac{4n-2}{n+5}}$ is a rational number. (A rational number is a number that equals the quotient of two integers. So, $\frac{4}{5}$ is a rational number, but $\sqrt{2}$ and π are not rational numbers.)
3. The game "Fifteens" is a 2-player card game with a special deck. The deck consists of 40 numbered cards, where each number from 1 to 10 is on four cards. (Each card has only one number.) At the beginning, the two players are given 20 cards each. Each turn one player either puts a card on the table or removes some cards from the table whose sum is 15. At the end of the game, one player has a '5' and a '3' in his hand, on the table there's a '9', and the other player has a card in his hand. What is its value?
4. Three married couples arrange a party for themselves. All six people arrive at different times to the party. Each person, upon arriving, shakes the hand of everyone already there, except his or her own spouse. When everyone has arrived, Bob, one of the husbands, asks all the others how many hands they shook upon arriving, and gets five different answers. How many hands did Bob shake upon arriving?
5. The sequence v, w, x, y, z has the property that for any positive integer $n \leq 5$, the average of the first n terms is 2^n . Find z .
6. The sum of some positive integers (not necessarily all distinct) is 20. What is the maximum possible value of their product?
7. Find the smallest positive multiple n of 15 such that every digit of n is either 0 or 7.
8. Find all triples of real numbers (a, b, c) such that $2a^2 - 4b^2 - 5bc = 24$ and $a : b : c = 6 : 2 : 5$.