
Part A

1. If $4x - 13 = 43$ then the value of x is

- (A) 8 (B) 10 (C) 12 (D) 14 (E) 16
-

2. Calculate the sum $1.2 + 2.3 + 3.4 + 4.5 + 5.6 + 6.7 + 7.8 + 8.9 + 9.1$

- (A) 49.5 (B) 50 (C) 50.5 (D) 51 (E) 51.5
-

3. Which is the largest fraction?

- (A) $\frac{1}{2}$ (B) $\frac{3}{5}$ (C) $\frac{4}{7}$ (D) $\frac{5}{9}$ (E) $\frac{6}{11}$
-

4. If 333 cats eat 666 mice in three days, how many mice will be eaten by 111 cats in a week?

- (A) 222 (B) 444 (C) 518 (D) 555 (E) 592
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5. Jacques likes to buy books from used book stores. During his vacation, he visited five used book stores. At each store, after the first, he bought two more books than he had bought at the previous store. When he returned home, he counted and found that he had bought 50 books. How many books did Jacques buy from the fifth book store he visited?

- (A) 9 (B) 11 (C) 12 (D) 13 (E) 14
-

6. Fred's birthday is the same day as the millionth second of the year. What day is Fred's birthday?

- (A) Jan.2nd (B) Jan.10th (C) Jan.12th (D) Jan.15th (E) Feb.1st
-

7. If $a \times b = n$, then a and b are said to be factors of n . The positive factors of 6 are 1, 2, 3 and 6. What is the product of all the positive factors of 100?

- (A) 10^5 (B) 10^6 (C) 10^7 (D) 10^8 (E) 10^9
-

8. Martine has a bag of marbles. When she counts them two at a time, three at a time or four at a time, there is always one marble left. Which of the following numbers **can not** be the number of Martine's marbles?

- (A) 23 (B) 25 (C) 37 (D) 61 (E) 73
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9. What is the value of the following expression?

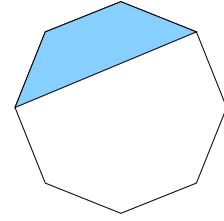
$$\frac{8^2 \cdot 48 \cdot 12 \cdot 9^2}{64^2 \cdot 3^4}$$

- (A) 1 (B) 3 (C) 6 (D) 9 (E) 12
-

10. Grandpa Jules welcomes his three grand-daughters to his house. The product of the ages of the girls is 48 while the sum of their ages is 15. What is the age of the oldest girl?

- (A) 4 years (B) 6 years (C) 8 years (D) 10 years (E) 12 years
-

16. The diagram shows a regular octagon with side length one. Regular means that all sides have the same length and all angles have the same measure. What is the area of the shaded region?



- (A) $\frac{1 + \sqrt{2}}{2}$ (B) $\frac{3}{2}$ (C) $\frac{2 + \sqrt{2}}{2}$ (D) $1 + \sqrt{2}$ (E) 3

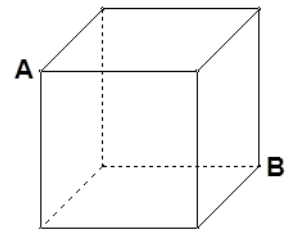
17. The last digit of 2^{2013} is

- (A) 0 (B) 2 (C) 4 (D) 6 (E) 8

18. Nabil is in room 1401. He calls Martin and says “what room are you in”. Martin replies: “the number of the room I’m in less the number of the room you’re in is 100 times the n^{th} prime number, where n is the smallest number with six positive factors”. What room is Martin in? (If $n = a \times b$, then a and b are said to be factors of n . The positive factors of 6 are 1, 2, 3, 6).

- (A) 2701 (B) 3301 (C) 4501 (D) 5101 (E) 5501

19. In the shown cube, A and B are on opposite corners and each edge of the cube has length one. An ant walks from A to B along the edges of the cube. What is the length of the longest path the ant can walk, without using any edge more than once nor passing twice by the same corner?



- (A) 6 (B) 7 (C) 8 (D) 9 (E) 10

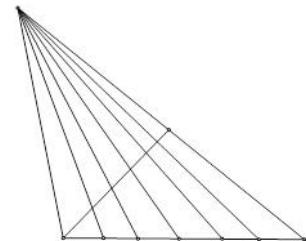
24. Carole, David and Julie are planting tomato plants. When Carole works with Julie, they plant one row of tomatoes in one hour. When Carole works with David, they plant one row of tomatoes in 75 minutes. When David works with Julie, they plant one row of tomatoes in 100 minutes. How long does it take, in minutes, for the three of them, working together, to plant a row of tomatoes? All the rows have the same number of tomato plants.
- (A) 40 (B) 42 (C) 45 (D) 48 (E) 50

25. A magic square is a square of numbers in which the sum of the numbers in each row, in each column and in each diagonal is always the same. Hichem wants to fill a magic square using the numbers 1 to 16 once each. He has filled some of the boxes as shown in the diagram. Which number must he put in the shaded box?

14	1		
11			2
	10	3	

- (A) 4 (B) 5 (C) 6 (D) 7 (E) 8

26. How many triangles are there in this picture?



- (A) 15 (B) 36 (C) 42 (D) 48 (E) 53