
Part A

1. If $3x - 6 = 33$ the value of x is

- (A) 7 (B) 11 (C) 13 (D) 15 (E) 17
-

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
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3. To make cookies, Sylvie uses $\frac{2}{3}$ cups of chocolate chips for each cup of flour. One day she makes a lot of cookies. She uses $4\frac{1}{2}$ cups of flour. How many cups of chocolate chips did she use?

- (A) 3 (B) $3\frac{1}{4}$ (C) $3\frac{1}{3}$ (D) 4 (E) $6\frac{3}{4}$
-

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) 13 (B) 25 (C) 35 (D) 61 (E) 73
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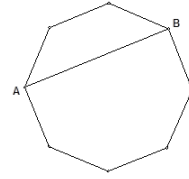
9. Which is the largest fraction?

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

10. The digits 4, 7, 2 and 5 can be arranged to make many different four digits numbers. What is the sum of the largest and the smallest of these numbers?

- (A) 9898 (B) 9999 (C) 10028 (D) 10102 (E) 10409
-

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 length of the segment AB?



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

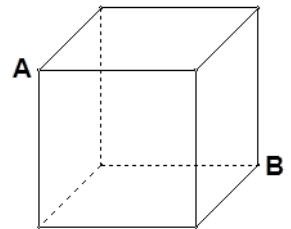
17. How many integers n (including negative integers) are such that $\frac{15 - n}{3 - n}$ is an integer?

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

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).

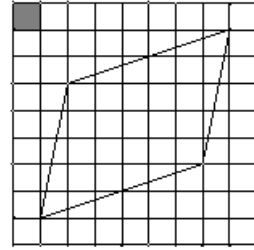
- (A) 2701 (B) 3301 (C) 4501 (D) 5101 (E) 5501

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

20. A 1 by 1 square is shaded in the shown grid. What is the area of the parallelogram?



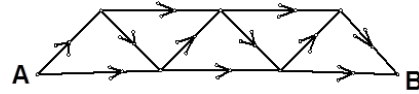
- (A) 22 (B) 24 (C) 26 (D) 28 (E) 30

Part C

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

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

22. In the shown diagram, how many paths are there from A to B, if you must always move in the direction of the arrows?



- (A) 9 (B) 10 (C) 11 (D) 12 (E) 13

23. One day Paul swam one kilometer at 5 km/h, then bicycled one kilometer at 25 km/h, then ran one kilometer at 10 km/h. To the nearest km/h, what was his average speed over the three kilometers?

- (A) 7 (B) 9 (C) 11 (D) 13 (E) 20

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. John numbers his photos using the numbers between 1 and 199 that are multiples of exactly one of the numbers among 3, 5 or 7. For example 9 is such a number but 15 is not. How many photos does he have?

(A) 66 (B) 79 (C) 82 (D) 104 (E) 107

26. 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