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**Part A**

1. Evaluate the expression

$$\frac{1 + \frac{1}{2}}{1 - \frac{1}{3}}$$

- (A)  $\frac{2}{3}$       (B) 1      (C)  $\frac{3}{2}$       (D)  $\frac{9}{4}$       (E) None of these
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2. A bowl contains some red candies and some green candies. Two thirds of the candies are red. Paul takes out 20 red candies and puts in 15 green ones. If the numbers of red and green candies are now equal, how many of candies are now in the bowl?

- (A) 60      (B) 70      (C) 100      (D) 210      (E) None of these
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3. What is the sum of all the positive integers that divide 24 and do not leave a remainder?

- (A) 36      (B) 48      (C) 52      (D) 60      (E) 78
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4. The first three terms of a sequence are 1, 2, and 3. Each succeeding term is the sum of the last three terms. What is the 8th term of the sequence?

- (A) 37      (B) 57      (C) 68      (D) 78      (E) 125
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5. The sum of 5 consecutive integers is 125. What is the value of the second largest of these integers?

- (A) 21      (B) 22      (C) 23      (D) 25      (E) 26
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6. A student submits 10 assignments in a course. The average of the 7 highest marks on the assignments is 28 and the average of the 3 lowest marks is 18. What is the average mark for all of the assignments?

- (A) 20      (B) 23      (C) 24      (D) 25      (E) None of these
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7. Alice eats  $\frac{1}{4}$  of a pizza. Bob then eats  $\frac{1}{3}$  of what is left. Finally, Christine eats  $\frac{1}{2}$  of the remaining pizza. What proportion of the pizza did they not eat?

- (A)  $\frac{1}{24}$       (B)  $\frac{1}{12}$       (C)  $\frac{1}{4}$       (D)  $\frac{1}{3}$       (E) None of these
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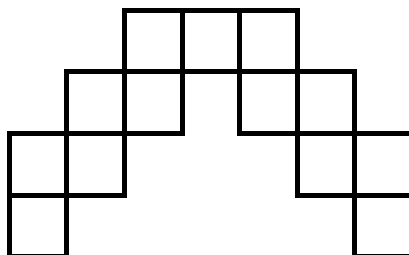
8. A triangle has the same area and base as a rectangle. If the rectangle height is 6 cm, then the triangle height is
- (A) 3 cm              (B) 6 cm              (C) 9 cm              (D) 12 cm              (E) None of these
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9. A palindrome is a number that still reads the same when you write it backward. How many 4 digit numbers starting with a 2 are palindromes?
- (A) 10              (B) 100              (C) 1 000              (D) 10 000              (E) None of these
- 
10. Canada has a population of 33 million while Russia has 144 million inhabitants. Indonesia's population is 50% greater than that of Russia while it is only 72% of the population of the United States. How many million people must be added to the United States so that the population of that country becomes 10 times that of Canada?
- (A) 3              (B) 27              (C) 30              (D) 33              (E) Not enough information
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## Part B

11. How many three digit numbers can be made using the digits from 1 to 5 so that the same digit is not used twice in a row? For example, 121 is such a number, but 112 is not.

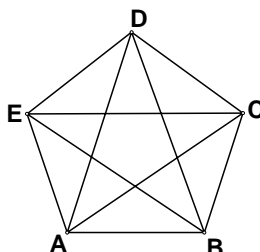
(A) 60                      (B) 70                      (C) 80                      (D) 125                      (E) None of these

12. What is the length of the perimeter of the figure shown below? Each block is a square with sides of length 1.



(A) 24                      (B) 28                      (C) 30                      (D) 32                      (E) None of these

13. How many different ways can one travel from A to E in the figure shown? A path must travel in a straight line turning only at the points A, B, C, D, E and must go through every lettered point exactly once.

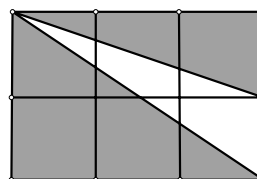


(A) 6                      (B) 7                      (C) 8                      (D) 10                      (E) 15

14. What is the average distance between two corners of a square of side 1?

(A)  $\frac{\sqrt{2}}{2}$                       (B) 1                      (C)  $\frac{2}{3} + \frac{1}{3}\sqrt{2}$                       (D)  $\frac{1}{2} + \frac{1}{2}\sqrt{2}$                       (E) None of these

15. The figure shown is constructed of 6 squares each having side length 1. What is the area of the shaded portion?



(A) 3                      (B)  $2\sqrt{3}$                       (C) 4                      (D)  $3\sqrt{2}$                       (E) 4.5

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16. Ali has a box of Canadian coins. Using coins from the box, he can make every total from 1 cent to 49 cents. What is the smallest number of coins that Ali can have in the box?

- (A) 6                      (B) 7                      (C) 8                      (D) 9                      (E) None of these
- 

17. The numbers from 1 to 5 are written in a  $5 \times 5$  array so that each number appears exactly once in each row and each column. Some of the numbers have already been entered. What number goes in the place marked by the X?

	2		5	
	3		2	
1				4
			4	3
5		X		

- (A) 1                      (B) 2                      (C) 3                      (D) 4                      (E) Not enough information
- 

18. Which digit appears most often when writing the integers from 1 to 100?

- (A) 0                      (B) 1                      (C) 3                      (D) 9                      (E) All appear equally often
- 

19. Anne, Bernard and Charlotte each had some pennies. They decided to divide their pennies in the following way. Bernard gave one-half of his pennies to Charlotte and kept the rest. Anne then gave one-third of her pennies to Bernard and one-sixth of them to Charlotte. At the end, each had 27 pennies. How many pennies did Charlotte have originally?

- (A) 9                      (B) 12                      (C) 15                      (D) 18                      (E) Not enough information
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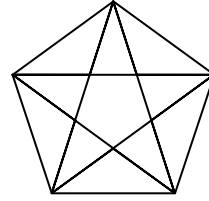
20. The planet-year of a given planet is the time it takes the planet to make a complete revolution around the sun. An Earth-year is simply equal to 1 year. Simplifying the laws of celestial mechanics, the square of the duration of a planet-year is proportional to the cube of the distance between the planet and the sun. Knowing that Jupiter is roughly 5 times as far from the Sun than the Earth, then the duration of the Jupiter-year is approximately

- (A) 5 years                      (B) 7 years                      (C) 9 years                      (D) 11 years                      (E) 13 years
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**Part C**

21. How many different triangles are contained in the figure shown?



- (A) 10                      (B) 15                      (C) 20                      (D) 25                      (E) More than 25
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22. The sum of all the digits used in writing the integers from 1 to 10 is 46. What is the sum of all the digits used to write the integers from 1 to 50?

- (A) 230                      (B) 240                      (C) 270                      (D) 284                      (E) 330
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23. A car leaves a starting point and drives at 60 km/hour. A second car leaves the same starting point some time later following the first car at a speed of 75 km/hour. It catches the first car after traveling a distance of 30 km. How many minutes later did the second car leave?

- (A) 5 min.                      (B) 6 min.                      (C) 12 min.                      (D) 24 min.                      (E) None of these
- 

24. The last digit of  $3^{2007}$  is

- (A) 1                      (B) 3                      (C) 5                      (D) 7                      (E) 9
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25. There are 120 different five digit numbers that can be constructed by putting the digits 1, 2, 3, 4 and 5 in all possible different orders. If these numbers are placed in numerical order, from smallest to largest, what is the 60th number in the list?

- (A) 31245                      (B) 32145                      (C) 32415                      (D) 32541                      (E) 34125
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26. If  $2^5 = 32$ , then  $2^{100}$  is closest to

- (A)  $10^{10}$                       (B)  $10^{15}$                       (C)  $10^{20}$                       (D)  $10^{25}$                       (E)  $10^{30}$
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