Part A

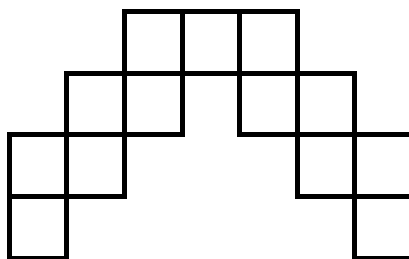1. Evaluate the expression

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

(A) 1   (B) $\dfrac{7}{5}$ (C) $\dfrac{11}{6}$ (D) $\dfrac{11}{5}$ (E) 11

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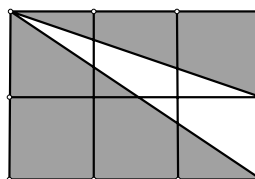

(A) 24   (B) 28   (C) 30   (D) 32   (E) None of these

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4. The largest of the numbers given below is

(A) 0.95   (B) $\left(1-\dfrac{1}{5}\right)\left(1+\dfrac{1}{5}\right)$ (C) $1-\dfrac{1}{5}+\dfrac{1}{10}$ (D) $\dfrac{12}{13}$ (E) All are equal

5. 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

6. On the first day Juanita receives 1 dollar. On each succeeding day, she receives 1 dollar more than the total received in all preceding days. On which day will she first receive an amount greater than one hundred dollars?

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

7. The sum of 9 consecutive integers is 369. The middle integer is

   (A) 35   (B) 38   (C) 40   (D) 41   (E) None of these

8. 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

9. Bob and Nabil have some sheep and hens in a yard. Bob counts the heads and finds 18 while Nabil counts the legs and finds 44. How many sheep are there in this yard?

   (A) 2   (B) 4   (C) 6   (D) 8   (E) 11

10. Canada has a population of 33 million while Russia has 144 million inhabitants. Indonesia's population is 50% greater then 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

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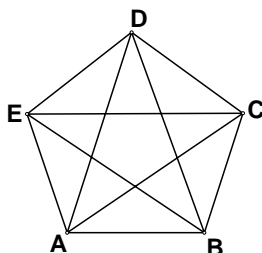
    (A) 6   (B) 7   (C) 8   (D) 10   (E) 15

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

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

14. 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 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

15. The numbers from 1 to 5 are written in a 5 x 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

16. All of the customers at a fruit store purchased some apples or some bananas. If 75% of the customers purchased apples and 40% of them purchased bananas, while 9 customers bought both, how many customers did the store have?

   (A) 15   (B) 60   (C) 120   (D) 180   (E) Not enough
                                                                            information

17. Which digit appears most often when writing the integers form 1 to 100?

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

18. 60 cubes are glued together in a 3 x 4 x 5 rectangular shape. The entire outside of the object is painted. Then, it is broken apart again, back to the original cubes. How many of the cubes have exactly one painted face?

   (A) 11   (B) 22   (C) 33   (D) 44   (E) 52

19. Sylvie and Mary have a bag of marbles. When they split these marbles into two equal piles, one marble remains. When they split these marbles into three equal piles, once again one marble remains. Among the following numbers, which one cannot represent the number of marbles that Sylvie and Mary have?

   (A) 7   (B) 13   (C) 25   (D) 31   (E) 41

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

Part C

21. How many different triangles are contained in the figure shown?
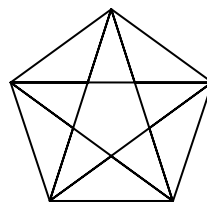
 (A) 10   (B) 15   (C) 20   (D) 25   (E) More than 25

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

23. It is possible to construct 504 different 3-digit numbers using the digits from 1 to 9 so that no digit is repeated in a given number. How many of those numbers will have their digits in increasing order?

 (A) 84   (B) 126   (C) 168   (D) 252   (E) None of these

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

 (A) 1   (B) 3   (C) 5   (D) 7   (E) 9

25. Every morning, Claude leaves his house to go to work. When he drives at 60 km/h, he gets to work 3 minutes late. When he drives at 80 km/h, he gets to work 15 minutes early. How far is Claude's house from his work?

 (A) 24 km   (B) 36 km   (C) 72 km   (D) 108 km   (E) Not enough information

26. A regular hexagon (a 6 sided polygon with all sides and all angles equal) is inscribed in a circle of radius 1. The area of this hexagon is equal to

 (A) $\dfrac{3\sqrt{2}}{2}$ (B) 3   (C) $3\sqrt{3}$ (D) 6   (E) None of these