Part A

1. Suppose that $a * b = 2b - a$. What is the value of $(2*1)*(2*1)$?

   (A) -3   (B) -2   (C) 0   (D) 3   (E) 4

2. The price of a book increases by 25%. How much would the price now have to decrease to be the same as it was before?

   (A) 20%   (B) 25%   (C) 40%   (D) 50%   (E) Not enough
                                                                              information

3. What is the shaded area in the given figure?
   The three squares have sides of length 3, 5, and 7.

   (A) 24   (B) 32   (C) 33   (D) 36   (E) None of these

4. Roman uses an average of 20 litres of gasoline per week. He pays 75¢ per litre. Of the following, the closest estimate of the yearly gasoline bill is

   (A) $200   (B) $400   (C) $600   (D) $800   (E) $1000

5. In a class of 25 students, 18 students enjoy mathematics and 22 students enjoy music. If every student in the class enjoys at least one of these, how many students in the class enjoy both?

   (A) 3   (B) 7   (C) 15   (D) 20   (E) None of these

6. How many cubic millimetres are in a cubic kilometre?

   (A) 10^9 (B) 10^{12} (C) 10^{15} (D) 10^{18} (E) 10^{21}

7. Starting at 5 and counting by 7's, Samuel counts 5, 12, 19, …. A number that will be counted is

   (A) 85   (B) 86   (C) 87   (D) 88   (E) 89

8. The value of $\dfrac{2}{3} + \dfrac{2}{9} \times \dfrac{3}{4}$ is

   (A) $\dfrac{5}{9}$ 　　　　 (B) $\dfrac{2}{3}$ 　　　　 (C) $\dfrac{5}{6}$ 　　　　 (D) 1 　　　　 (E) $\dfrac{4}{3}$

9. A crate filled with empty bottles weighs 2 kg. The empty crate weighs 1.6 kg less than the bottles. How much does the empty crate weigh?

   (A) 200 g 　　　 (B) 300 g 　　　 (C) 400 g 　　　 (D) 1.6 kg 　　　 (E) 1.8 kg

10. How many different numbers can be constructed using the digits 0, 1, 2, 2? All of the digits must be used each time and no number can begin with 0.

   (A) 6 　　　　 (B) 9 　　　　 (C) 12 　　　　 (D) 15 　　　　 (E) 24

Part B

11. If Alphonse can shovel a walk in 2 hours and Beatrice can shovel the same walk in 1 hour, how many minutes will it take for them to shovel the walk together?

    (A) 24   (B) 30   (C) 40   (D) 45   (E) None of these

12. Paul bought some candies and gave the storekeeper $1. He received 4 coins in change. The cost of the candies could **not** be

    (A) 30¢   (B) 39¢   (C) 65¢   (D) 74¢   (E) The cost could be
                                                                        each of these.

13. What is the next number in the sequence   1, 2, 3, 4, 6, 9, 13, 19, 28, …?

    (A) 37   (B) 39   (C) 41   (D) 43   (E) 47

14. At 9:00 A.M. Paul starts driving from Alphaville to Betaburg at 40 km/hour. Sometime later, Nabil leaves Betaburg and drives at 60 km/hour. They meet at the half-way point between the cities at 1:00 P.M. At what time did Nabil start driving?

    (A) 10:00 AM   (B) 10:40 AM   (C) 11:00AM   (D) 11:20AM   (E) None of these

15. Roman, Bob and Roger buy red and green marbles. Red and green marbles don't have the same price. Roman pays 70 ¢ for four red marbles and two green marbles. Bob pays 95 ¢ for two red marbles and five green marbles. How much will Roger pay if he buys one red marble and one green marble?

    (A) 5 ¢   (B) 10 ¢   (C) 20 ¢   (D) 25 ¢   (E) 27 ¢

16. Find the value of x if $\dfrac{19}{5} = 1 + \dfrac{x}{1 + \dfrac{2}{1 + \dfrac{3}{4}}}$

   (A) 3   (B) 4   (C) 5   (D) 6   (E) 8

17. You throw two dice, one having 10 sides, labelled 1, 2, 3,…, 10 and the other having 8 sides, labelled 1, 2, 3, …, 8. In how many ways can you obtain a sum of 10?

    (A) 8   (B) 9   (C) 10   (D) 18   (E) 80

18. The sum of all of the integers from 1 to 30 is 465. The sum of all of the integers from 1 to 30 that are divisible by 3 is

    (A) 135   (B) 155   (C) 156   (D) 165   (E) None of these

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19. What is the value of the number in the box labelled A? Each of the empty spaces contains a number.

				Total
	A	**4**	**20**	
	4	**9**		
8			**13**	
Total	**24**		**16**	**55**

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

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20. Three planets are in straight line as in the diagram below. Planet A makes a complete revolution around the Sun S in 2 years. Planet B makes its revolution in 4 years and Planet C in 6 years. What is the least number of years before all three planets will once again be on the same line?
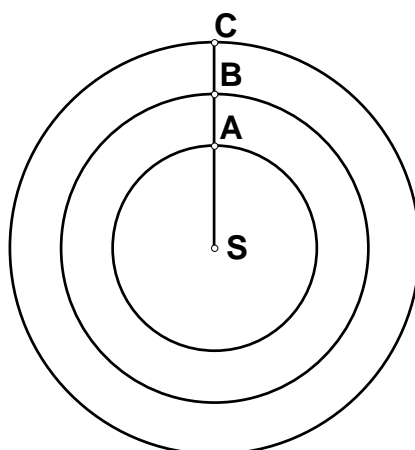
    (A) 6 years   (B) 8 years   (C) 9 years   (D) 12 years   (E) 24 years

Part C

21. If the distance is measured between any two of the points in the array given, how many distinct distances are possible? Adjacent points horizontally and vertically are the same distance apart.

$$\begin{matrix} \bullet & \bullet & \bullet \\ \bullet & \bullet & \bullet \\ \bullet & \bullet & \bullet \end{matrix}$$

   (A) 5   (B) 6   (C) 7   (D) 8   (E) None of these

22. Using coins with values of 1¢, 5¢, 10¢ and 25¢, what is the smallest number of coins needed to be able to exactly make each total from 1¢ to $1.00?

   (A) 10   (B) 11   (C) 12   (D) 15   (E) None of these

23. Find the value of $(1+\frac{1}{1})\times(1+\frac{1}{2})\times(1+\frac{1}{3})\times(1+\frac{1}{4})\times...\times(1+\frac{1}{2004})$

   (A) 0   (B) 2004   (C) 2005   (D) 4008   (E) None of these

24. Find the largest number among these:

   (A) 2^{2004} (B) 2004^2 (C) 2000^4 (D) 4^{2000} (E) $2\times4\times2000\times2004$

25. You are given a set of three numbers. If the numbers are added together two at a time, the sums are 23, 32 and 39. What is the sum of the three numbers?

   (A) 44   (B) 47   (C) 50   (D) 94   (E) None of these

26. E, F, G and H are the middle points of the sides of rectangle ABCD and K is the middle point of segment HE.

   If the rectangle ABCD has an area of 12 m^2, what is the area of the triangle KFG ?
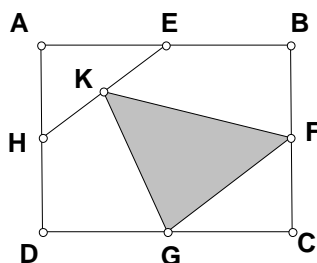
   (A) 2m^2 (B) 3m^2 (C) 4m^2 (D) 6m^2 (E) Not enough information