Part A

1. Evaluate the expression

$$1-\frac{1}{11}+\frac{3}{22}$$

(A) $\frac{10}{11}$ (B) $\frac{21}{22}$ (C) 1 (D) $\frac{23}{22}$ (E) $\frac{12}{11}$

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2. Define the operation a*b = ab - a + b. Evaluate (5*3) + (7*5).

(A) 42 (B) 44 (C) 46 (D) 48 (E) 50

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3. The sum of my age and my sister's age is 11. The product of our ages is 24. What is the difference of our ages?

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

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4. Gilles looks at his watch and notices that the time is 7:24. What time will it be 199 minutes later?

(A) 9:33 (B) 9:43 (C) 10:23 (D) 10:33 (E) 10:43

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5. The population of our town is 10 000 inhabitants. If the population of the town increases by 10% each year, what will the population of the town be 4 years from now?

(A) 13 000 (B) 13 310 (C) 14 000 (D) 14 641 (E) 40 000

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6. Tariq has a basket of fruit containing some apples and some oranges. 1/3 of the pieces of fruit are oranges. He gives away 40 apples and 10 oranges and finds that he now has an equal number of apples and oranges. How many apples did Tariq originally have in the basket?

(A) 20 (B) 30 (C) 40 (D) 60 (E) None of these

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7. What is the surface area of a solid rectangular box whose sides are of lengths, 8 cm, 12 cm and 20 cm?

(A) 248 cm^2 (B) 496 cm^2 (C) 992 cm^2 (D) 1920 cm^2 (E) None of these

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8. Three stones are weighed on a scale, two at a time. The scale shows weights of 49 kg, 63 kg, and 80 kg. How much does the heaviest stone weigh?

(A) 30 kg (B) 36 kg (C) 40 kg (D) 47 kg (E) Not enough information

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9. Each day Bob walks back and forth to his work from his home following the same path. He always walks at 2 km/h going up hills, at 3 km/h on level ground, and at 6 km/h going down hills. If the duration of a daily round trip is 2 hours, what distance does Bob walk from his home on his way to his work?

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

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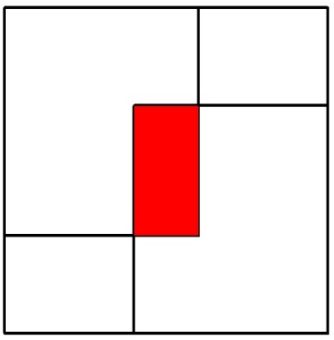
10. Two identical pieces of paper with dimensions of seven by six are placed in the corners of a square of side length equal 10 as shown in the diagram. What is the area of the shaded region? The longer side of each sheet of paper is parallel to the vertical sides of the square.



(A) 4 (B) 8 (C) 12 (D) 16 (E) None of these

Part B

11. The sum of the integers from 1 to 25 is 325. What is the sum of the integers from 26 to 50?

(A) 625 (B) 650 (C) 925 (D) 950 (E) None of these

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12. A palindrome is an integer that reads the same forward and backwards. For example, 31213 is a 5 digit palindrome. How many 3 digit palindromes are even?

(A) 30 (B) 36 (C) 40 (D) 45 (E) 50

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13. Ahcène, Nabil and Paul play each other in a tournament. Each game has a winner and a loser. The winner of the tournament is the first to win 10 games and the tournament ends when a winner is found. They play each other in the order: Ahcène vs. Nabil, Ahcène vs. Paul, and Nabil vs. Paul, repeating this order until the tournament ends. What is the smallest possible number of games in the tournament?

(A) 10 (B) 13 (C) 14 (D) 15 (E) 20

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14. Three men can cut 72 trees in three hours. Because of a shortage of space, each time one man is added, each of the workers can cut one less tree per hour. How many trees can 5 men cut in 5 hours?

(A) 30 (B) 50 (C) 90 (D) 150 (E) 200

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15. Every student in a school studies either mathematics or physics. Two-thirds of the students study mathematics and one-half of the students study physics. If seven students study both subjects, what is the total number of students in the school?

(A) 42 (B) 49 (C) 84 (D) 98 (E) None of these

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16. A farmer has 252 kg of apples. The apples are put into 2 kg and 5 kg bags. If the farmer uses twice the number of 5 kg bags as 2 kg bags, how many bags are used altogether?

(A) 21 (B) 42 (C) 56 (D) 63 (E) 70

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17. Roman has a bag containing marbles of four different colours. How many ways can he place four marbles in a row so that no two marbles adjacent to each other are of the same colour?

(A) 24 (B) 108 (C) 120 (D) 144 (E) 256

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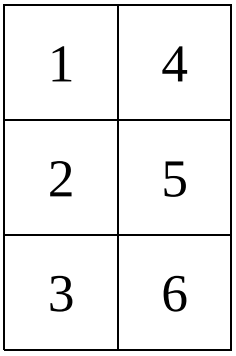
18. How many ways can we select four squares from the figure shown to create a connected region? A region is connected if each square shares at least one edge with some other square. For example, the region formed by the squares labelled 1,2,3 and 4 is connected.



(A) 8 (B) 9 (C) 10 (D) 12 (E) 13

19. A sequence is formed in the following way: The first two numbers of the sequence are 1 and 3. Each subsequent number is the sum of the previous two members of the sequence. What is the third even number of the sequence?

(A) 18 (B) 34 (C) 76 (D) 144 (E) 322

20. Which of the following numbers is closest to the number of seconds in one week?

(A) 20 000 (B) 60 000 (C) 200 000 (D) 400 000 (E) 600 000

Part C

21. How many ways can the numbers 1, 2, 3, 4 and 5 be placed in a line so that neither 1 nor 5 occupy either the first or the last place in the sequence?

(A) 6 (B) 24 (C) 36 (D) 54 (E) 72

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22. Maureen likes to play a game in which she reduces a number to a single digit. She adds the digits of the number together. When the total is still greater than nine, she adds the digits of the total together and continues in this way until she ends up with a single digit number. If Maureen does this for each of the integers from one to 100, how many times will she end up with a final result equal to one?

(A) 3 (B) 10 (C) 11 (D) 12 (E) 21

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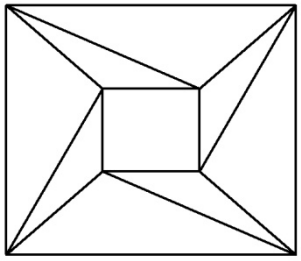
23. How many 4-sided figures can be found in the drawing at right?



(A) 10 (B) 12 (C) 13 (D) 14 (E) 18

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24. A number is said to be prime if it is evenly divisible only by itself and by one. Among the numbers given below, which one is not a prime number?

(A) 107 (B) 109 (C) 111 (D) 113 (E) All are prime

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25. How many ways can seven different single digit positive integers be chosen so that the sum of those integers equals 37?

(A) 2 (B) 3 (C) 6 (D) 7 (E) 36

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26. How many zeros appear at the end of the product $1 \times 2 \times 3 \times 4 \times \ldots \times 50$?

(A) 5 (B) 10 (C) 12 (D) 13 (E) None of these
