Edmonton Junior High Mathematics Competition 2005

Questions with Multiple Choices

1. The percentage of female employees in a company is more than 60% and less than 65%. The minimum number of employees overall is

   (a) 8 (b) 13 (c) 14 (d) 17

2. In a class, 14 students study French and 8 students study German. Among them, 3 students study both languages. If every student studies either French or German, the total number of students in this class is

   (a) 16 (b) 19 (c) 22 (d) 25

3. On each day of the week except Sunday, 8 students are on patrol duty. In each day, there are exactly 3 students who are on duty only on that day. The maximum number of students who are on duty during the week is

   (a) 28 (b) 30 (c) 33 (d) 48

4. None of the numbers a, b, c, d, e and f is zero. Of the following products ab, cd, ef, -ac, -be and -df, what is the minimum number of products that is(are) positive?

   (a) 0 (b) 1 (c) 2 (d) 3

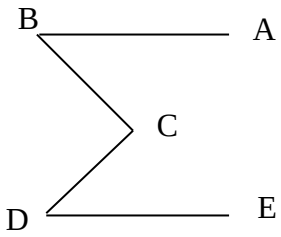
5. There are 15 pebbles in a single pile. In each move, we divide a pile with at least two pebbles into two piles, and write down the product of the numbers of pebbles in the two newly created piles. After 14 moves, the pebbles are in 15 separate piles. The sum of the 14 numbers that has been written down is

   (a) 91 (b) 105 (c) 210 (d) 225

6. A wire 12 centimeters long is to be cut into a number of pieces, which are bent and welded to form the 12 edges of a cube 1 centimeter on a side. The minimum number of pieces required is

   (a) 1 (b) 2 (c) 3 (d) 4

7. The Greek letter sigma consists of a broken line of four segments AB, BC, CD and DE, such that BA is parallel to DE and $\angle ABC = \angle CDE = 50^\circ$. The measure, in

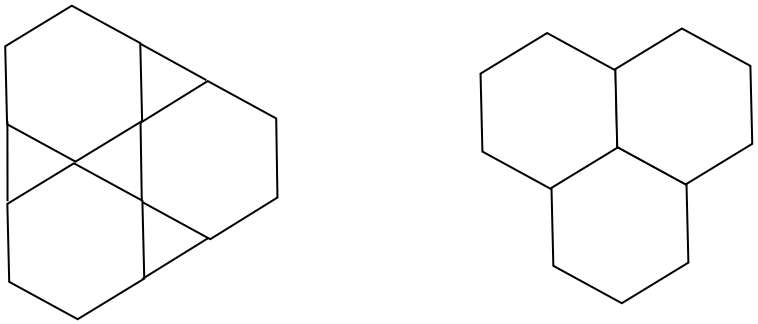


degrees, of $\angle BCD$ is

(a) 60° (b) 80° (c) 100° (d) 120°

8. Each figure in the diagram below consists of three regular hexagons, but the first is augmented by four triangles into an irregular hexagon. If the area of the second figure is 54 square centimeters, the area of the first figure, in square centimeters, is

(a) 63 (b) 66 (c) 69 (d) 72



9. A music store has six display racks each 100 centimeters long. It has 150 CD sets, some of which are singles each 3 centimeters thick, and the others are albums each 6 centimeters thick. All 150 CDs can be placed on the racks with nothing sticking out. The maximum number of albums among the 150 CD sets is

(a) 48 (b) 49 (c) 50 (d) 51

10. Initially, there is a 0 in each square of a 3 x 3 board. In each move, we add 1 to each number in any of the four 2 x 2 sub-boards. After a number of moves, someone erases the numbers at the four corner squares and the central square of the 3 x 3 board. The remaining four numbers are 9, 10, 12 and 13. The value of the number at the central square is

(a) 22 (b) 33 (c) 44 (d) dependent on the moves

Questions Require Answer Only

1. Ace, Bea and Cec are playing a two-player game. They decide at random who sits out the first game. After each game, the one who sits out plays the winner. If Ace has played exactly 10 games and Bea exactly 21 games, how many games has Cec played?

2. A vertical pole of length 27 meters is snapped into two pieces, which are still hinged together, the upper piece being the longer. The top of the pole now rests on the ground at a point 9 meters away from the bottom of the pole. What is the length, in meters, of the lower piece?

3. A scout starts from a point E 256 meters east of a point C and heads for a point N 192 meters north of C. At N, the scout makes a $90°$ left turn and reaches a point W west of C, makes another $90°$ left turn and reaches a point S south of C, and makes a final $90°$ left turn and reaches a point F east of C. What is the distance, in meters, between E and F?

4. In a race, Sven places exactly in the middle among all participants. Ray who placed 10^{th} finishes behind Sven. Sean places 16^{th}. What is the number of participants?

5. In an election, the ratio of the number of male voters to the number of female voters is 17:15. Had 90 of the male voters and 80 of the female voters stay home instead; the ratio would have been 8:7. What is the total number of voters?

6. Two five-digit numbers use each of the ten digits exactly once between them. What is the minimum value of their difference?

7. Among the seven-digit multiples of 9 whose digits are all different and the first digit is 8, which is the smallest?

8. Fiona wrote down a two digit number called n. She then wrote a new number m by reversing the two digits in n. The sum of m and n was the square of an integer, where $n > m$. What was the value of n?

9. At $50 per copy, a book is not selling. The bookshop reduced the price by an integral number of dollars, and sold out the entire stock, bringing in $3193. By how many dollars was the price of a book reduced?

10. Nick was very careless. He was supposed to divide a certain number by 7 and then add 72 to the quotient. He instead multiplied that number by 7, and subtracted 72 from the product. Amazingly, he got the same result which was the correct answer. What was this correct answer?