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5^{th} International Mathematics and Science Olympiad (IMSO) for Primary School 2008

Lombok, November 10, 2008

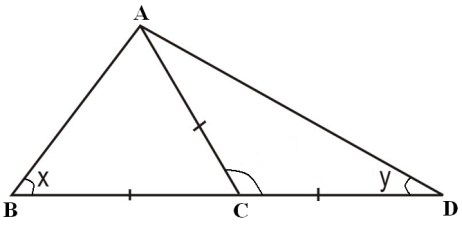
INSTRUCTIONS:

* Write down your name and country on every page.
* You have 90 minutes to work on this test.
* Write down your answer and explanation in English in the space below the question.
* Use pen or pencil to write your answer.

Name : .....

Country : .....

1. Find the measure of angle ABC as shown in the following figure, where $AC = CB = CD$, and the measure of angle ADC is $29°$.



Answer:

2. In 2008, the price of car A is \$20,000 and car B is \$25,000. Each year, the price of car A decreases by 5% and that of car B decreases by 10%. In what year will car B be cheaper than car A?

Answer:

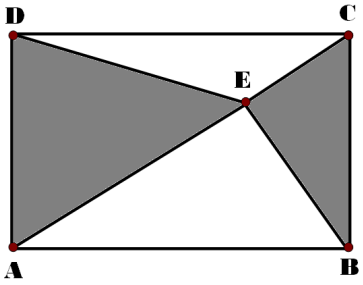
Name : .....

Country : .....

3. The average of 10 consecutive odd numbers is 120. What is the average of the 5 largest numbers?

Answer:

4. In the figure $ABCD$ is a rectangle, $AB = CD = 24$ cm and $AD = BC = 5$ cm. What is the area of the shaded region, in cm^2?



Answer:

Name : .....
Country : .....

5. You are asked to choose three different numbers from 1 to 10. The sum of the three numbers must be 12. How many choices do you have altogether?

Answer:

6. Five chairs are arranged in a row. A certain five participants must be seated at those chairs. Two of the five participants may not be seated next to each other. In how many ways can we arrange the seating of those five participants?

Answer:

Name : .....

Country : .....

7. Find the sum of all numbers from 1 to 500 that are divisible by 5 but not divisible by 2.

Answer:

8. Let M and N be the areas of a big square and a small square, respectively. The perimeter of the big square is equal to 25 times the perimeter of the small square. What is the ratio of M to N?

Answer:

Name : .....

Country : .....

9. Ahmad usually travels from town P to town Q in eight hours. One day, he increased his average speed by 5km per hour so that he arrived 20 minutes earlier. Find his usual average speed, in km per hour.

Answer:

10. Nadia wants to make a square using rectangular cards measuring 12.5 cm by 7.5 cm. The cards may not overlap and there may be no gaps between the cards. What is the least number of cards needed?

Answer:

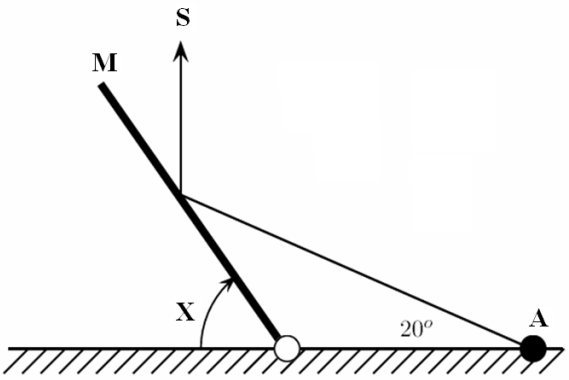
Name : .....

Country : .....

11. Jenny has a number of books in her bookshelf. She will move all the books to another bookshelf. If she moves 2 books repeatedly then she will have 1 book left. There will also be 1 book left if she moves 3, or 4, or 5 books repeatedly. If she moves 7 books repeatedly, she will have no books left. If the number of all the books is less than 500, find the number of Jenny's books.

Answer:

12. Light from point A makes an angle of 20° to the horizontal plane. It is then reflected by plane mirror M, see the side-view figure on the right. What is the measure of the angle X that makes the reflected light S perpendicular to the horizontal plane?



Answer:

Name : .....

Country : .....

13. Consider the sequence $25, 76, 38, 19, 58, 29, \ldots$.
The terms of the sequence are determined by the following rules:

- If a term is even, then the next term is half of it.
- If a term is odd, then the next term is 3 times of it plus 1.

What is the 1000^{th} term?

Answer: