

2014 Individual Event

No calculators are permitted during this tournament.

Time Limit: 30 minutes.

1. What number belongs in the box to make the statement true? $11 \times \square = 4321 \times 22$

2. Mary had 20 little lambs. All but 6 ran away. How many little lambs did Mary then have?

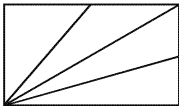
3. In the multiplication example at the right, A and B represent two different digits. What two-digit number does AB represent?

$$\begin{array}{r} 36A \\ \times AB \\ \hline 36AB \end{array}$$

4. A restaurant has 5 tables that seat 2 people each, 10 tables that seat 4, and 3 tables that seat 6. Each waitress can handle up to 15 people. What is the fewest number of waitresses needed if every seat is taken?

5. How many odd numbers between 10 and 100 are divisible by 3?

6. How many acute angles of all sizes appear in the rectangle at the right?



7. The meaning of $2!$ is 2×1 , the meaning of $3!$ is $3 \times 2 \times 1$, and the meaning of $4!$ is $4 \times 3 \times 2 \times 1$. Their values are 2, 6, and 24 respectively. What whole number must be subtracted from $5!$ in order to result in the largest perfect square number that is less than $5!$?

8. A poster contains two rectangular photographs, $ABCD$ and $JKLM$. On that poster $AB = 40$ mm, $BC = 30$ mm, $JK = 28$ mm and $KL = 24$ mm. If the poster and everything on it is enlarged uniformly so that AB becomes 50 mm, what is the area of the enlarged rectangular photograph $JKLM$?

9. What is the value of $2500 + 2499 - 2498 - 2497 + 2496 + 2495 - 2494 - 2493 + \dots + 4 + 3 - 2 - 1$, if the pattern of the addition of two consecutive integers alternating with the subtraction of two consecutive integers is followed throughout?

10. The fraction X can be called an extended complex fraction. What simple fraction in lowest terms is equivalent to X?

$$X = \frac{1}{2 + \frac{3}{4 + \frac{5}{6}}}$$

2014 Team Event

*No calculators are permitted during this tournament.
Time limit: 20 minutes*

11. What is the least multiple of 12 that is greater than 200?
12. What is the sum of the prime factors of 105?
13. The math club has 22 members. The school band has a total of 26 members. A total of 41 people have joined at least one of these activities. How many people have joined both activities?
14. Toni has a total of 34 pennies and nickels. Their total value is 98 cents. How many pennies does she have?
15. Every digit of a 100-digit number is a 7. What is the remainder if the number is divided by 12?
16. The tower shown consists of cubes piled on each other. There are no gaps. After the tower is painted on all sides including the bottom and backs, it is cut into individual cubes. How many cubes have been painted on exactly 3 faces?
17. The numerator of a fraction contains two of the numbers 2, 3, 5, 7, and 9, which are added, subtracted, or multiplied. The denominator contains two of the other numbers and they are added, subtracted, or multiplied. What is the greatest possible value of the fraction?
18. How many different sums are possible if ten standard dice are rolled?
19. A rectangular piece of tin is 9 units wide and 12 units long. A square 2 units on each side is cut from each corner and discarded. The four flaps of the remaining figure are then folded up to form a tin box with no top in the shape of a rectangular solid. What is the volume of the resulting rectangular solid?
20. The cost for the computer club to replace its laptop is \$315, to be shared equally by all members. The school will pay the rest. By recruiting four new members to join the club, the cost to each member dropped by \$5. What was the cost per member before the four new members joined the club?

