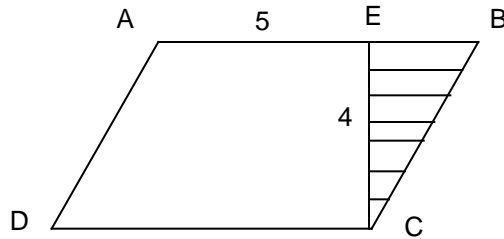


Illinois Mathematics and Science Academy
Mu Alpha Theta's
2001 Junior High Math Contest
Seventh Grade Individual

1. Of 100 travelers, 10 understand neither English nor Russian. 75 know English, and 83 know Russian. How many travelers know both English and Russian?

2. Parallelogram ABCD has an area of 32 cm^2 . If $AE = 5 \text{ cm}$ and $ED = 4 \text{ cm}$, then what is the area of the shaded portion?



3. A snail is climbing up a 10-meter pole. Between from sunrise and sunset, it climbs 5 meters. Everyday after sunset, the snail slips 4 meters overnight. And then it starts climbing again at sunrise. Assuming the snail starts on the bottom at sunrise of the day, how many days will it take the snail to reach the top of the pole?

4. Find the median of the number of edges, number of vertices, and number of faces of a cube.

5. The lengths of a pair of opposite sides of a 27 by 27 square are increased by 2 while the lengths of the other pair were reduced by 2. What is the positive difference between the area of the original square and the area of the new square?

6. Given $x:y:z = 4:5:7$, find the value of $\frac{x + y + z}{y + z}$.

7. Find the surface area of a $2 \times 3 \times 5$ rectangular solid.
8. A number's decimal place is shifted one place to the right, producing a new number that is 36 greater than the original. What is the original number?
9. At a local gymnastic competition, five judges gave points for a routine by one gymnast. Disregarding the highest and lowest scores produced an average score of 9.46. If you only ignore the highest score, then the average would be 9.40 points. Ignoring the lowest score instead produces a score of 9.50. What is the difference between the highest and lowest scores given by the judges?
10. There are four friends. The first friend is a certain age and the second friend is one year older than the first. The third friend is one year older than the second one and so on. The product of their ages is 360. How old is the oldest friend?
11. An elementary school is hosting a math competition, which has a total of 15 questions. For every correctly answered question the student is awarded 8 points, but for every wrong answer or blank, 4 points are taken off. A student received 72 points. He correctly answered how many questions?
12. From 12:01 am on one day to 11:59 pm the same day, how many times do the hour and minute hands cross?
13. A monkey went to steal bananas from a tree. On the first day, he stole $\frac{1}{10}$ of the total number of bananas, and on the second day he stole $\frac{1}{9}$ of the remaining bananas. This continues until the fifth day when he stole $\frac{1}{6}$ of the remaining bananas. After stealing on the fifth day, there were only 50 bananas left. How many bananas were there to start out with?

14. A master is chasing after his dog. For every three steps the dog takes, the master takes two. However one of the master's steps is equal to two of the dog's in length. The dog runs 10 steps before the master begins chasing. When the master finally catches up with the dog, how many steps has the dog taken?

15. Express the number 14 as the sum of fewer than 4 positive integers. What is the largest possible product resulting from these integers?

16. Begin with the fraction $\frac{1}{13}$. Adding the same number to both the numerator and the denominator will produce a fraction equivalent to $\frac{3}{5}$. What is the number that must be added?

17. If $\frac{2m}{3} = \frac{5n}{6}$, then the value of $\frac{(m-n)}{n}$ is:

18. Three cows and eight sheep consume a total of 93 pounds of grass in a day. Five cows and fifteen sheep consume 165 pounds each day. How many pounds do one sheep and one cow consume together in one day?

19. A square piece of paper is cut into two parts using a sequence of straight cuts. If one of the smaller pieces has 10 vertices, what is the maximum number of vertices the other piece could have?

20. A certain sporting goods store imported 100 basketballs and 80 volleyballs for \$2800. When selling the products, the price for each basketball increased by 5% and for each volleyball by 10%. After all the products are sold, the store collected \$3020. How much is the sum of the prices of one basketball and one volleyball?