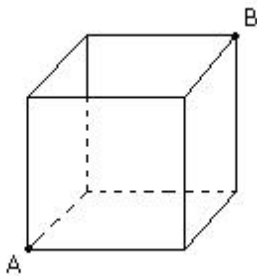


Illinois Mathematics and Science Academy
Mu Alpha Theta's
2000 Junior High Math Contest
Seventh Grade Team

1. What is the measure of the angle formed by the hands of the clock when it is 2:30?
2. A rectangular city block measures 300' by 400', including a 4-foot wide sidewalk which surrounds the block. After a blizzard uniformly dumped 15" of snow, what is the total number of cubic feet of snow that needs to be cleared from the side walk surrounding this city block?
3. Martha has 10 identical jellybeans that she is playing with. She likes to take them out and put them in groups of one jellybean and/or two jellybeans. How many different groupings can she create? [Note: One grouping would consist of 10 groups of one jellybean each.]
4. If $AB = 3\sqrt{3}$, find the volume of the cube.



5. In a chair factory, three and four legged chairs were made. After a day's work, 100 chairs were made with a total of 328 legs. How many three legged chairs were made that day?

6. If Max weighs $\frac{4}{5}$ of his weight plus forty pounds, how much does he weigh?

7. Terry has an average of 78 in science after 6 tests. How high must Terry score on the next test to have an average of 81? Assume all tests are worth the same value.

8. What is the area of a triangle whose sides have lengths 10 inches, 13 inches, and 13 inches?

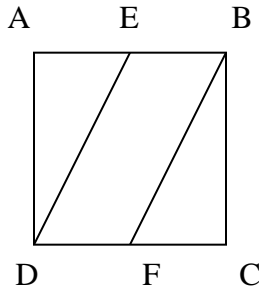
9. Matthew and Erin are freshmen at Costello College. Matt typically visits Erin (his girlfriend) in her dorm until 9:50 pm. Their dorms are 400 meters apart. Because of the layout of the college, Matt can cover the first 250 meters in 5 minutes and the last 150 meters in another 5 minutes, thus arriving at his dorm just in time for 10:00 check-in. However, Matt recently suffered a fall, injuring his leg, and now he can only limp along at half his previous rate over the first 250 meters and one-sixth his previous rate over the last 150 meters. What is the latest time that Matt can leave Erin's dorm and still make 10:00 check?

10. An auditorium has 20 rows of seats. The first row has 17 seats and each row has 2 more seats than the row in front of it. How many seats are in the room?

11. Jeff was playing a game of dice with himself. He says, "I bet I can roll a 6 on each of the three consecutive roles." What is the probability of Jeff succeeding?

12. The product of four distinct integers is 420. Find the largest possible number that could be one of these four.

13.



ABCD is a square of area 4. Points E and F are midpoints of AB and CD respectively. Find the area of DEBF.

14. What is the ratio of the length of the diagonal of a square to the length of the hypotenuse of the isosceles right triangle having the same area?
15. Big Yue was rowing upstream at a speed of 3 mph. After rowing for 5 hours he turns around and returns to his starting point 3 hours after turning back. Assuming the current is constant and Yue rows at a steady pace for all eight hours, what is the speed of the current?

16. If $\frac{X+3}{X+2} = \frac{X}{5}$, solve for X.

17. $7^7 + 7^7 + 7^7 + 7^7 + 7^7 + 7^7 + 7^7 = ?$

18. n is the first number in a sequence of five consecutive odd integers, what is the average of these five numbers in terms of n ?

19. It is 9 AM right now, what time will it be 4560 seconds from now?

20. $\frac{2m+2}{2} = \frac{3+n}{3}$ What is the ratio of $m : n$?

Answer Key: 2000 7th Grade Team
(no guarantees whatsoever!)

1. 105
2. 6920
3. 89 ways
4. 27
5. 72
6. 200
7. 99
8. 60
9. 9:20 pm
10. 720
11. $\frac{1}{216}$
12. 70 ($1*2*3*70=420$)
13. 2
14. (2)
15. 1 mph
16. 3
17. 5764801
18. n
19. 10:16
20. $\frac{1}{3}$