



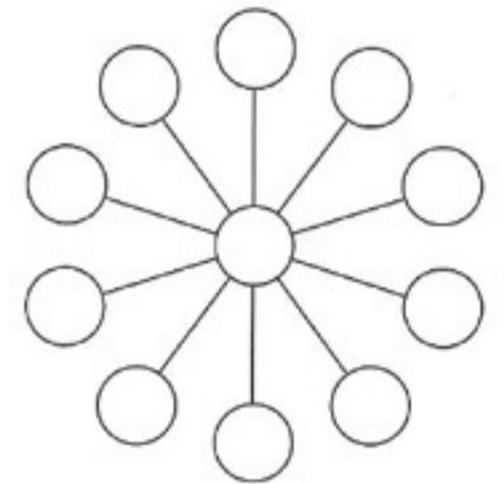
2017-2018 年度美国“大联盟” (Math League) 思维探索第一阶段活动
(四年级)

(活动日期: 2017 年 11 月 26 日, 答题时间: 90 分钟, 总分 200 分)

学生诚信协议: 答题期间, 我确定没有就所涉及的问题或结论, 与任何人、用任何方式交流或讨论, 我确定我所填写的答案均为我个人独立完成的成果, 否则愿接受本次成绩无效的处罚。

选择题: 每小题 5 分, 答对加 5 分, 答错不扣分, 共 200 分。

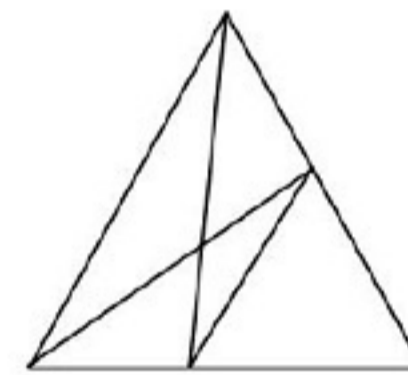
- Which of the following is the smallest?
A) 2.018 B) 20.18 C) 0.218 D) 2018
- What is the least common multiple of 20 and 18?
A) 90 B) 180 C) 240 D) 360
- The sum of the degree-measures of the exterior angles of a triangle is?
A) 180 B) 360 C) 540 D) 720
- In the figure on the right, please put the numbers 1 – 11 in the eleven circles so that the three numbers in every straight line add up to 18. What is the number in the middle circle?
Note: There are 5 straight lines in total in this figure.
A) 6 B) 7 C) 8 D) 9
- I am a lovely cat. When I multiply the digits of a whole number and the product I get is 8, I put that whole number on my list of favorite numbers. Of the whole numbers from 1000 to 9999, how many would I put on my list of favorite numbers?
A) 10 B) 12 C) 16 D) 20
- Two planes take off at the same time from the same point to race to a point and back. Plane A travels at 180 miles per hour on the way out and 240 miles per hour on the return trip. Plane B covers the entire distance at an average speed of 210 miles per hour. Which plane wins the race, or is it a tie?
A) plane A wins B) plane B wins
C) a tie D) non-deterministic
- $52 \times 88 = 44 \times \underline{\quad ? \quad}$
A) 102 B) 96 C) 104 D) 124
- What is the smallest whole number that leaves a remainder of 4, 5, 6 when divided by each of 5, 6, 7?
A) 29 B) 209 C) 210 D) 2009
- In $\triangle ABC$, $m\angle A + m\angle C = m\angle B$. What is the degree measure of $\angle B$?
A) 80 B) 90 C) 100 D) 180



10. I bought a toy for \$10, sold it for \$20, rebought it for \$30, and resold it for \$40. My total profit on the 4 transactions was ?
- A) 10 B) 20 C) 30 D) 40
11. What is the greatest number of integers I can choose from the first ten positive integers so that any 3 of the chosen integers could be the lengths of the three sides of a triangle?
- A) 4 B) 5 C) 6 D) 7
12. How many whole numbers between 200 and 400 have all their digits increasing in value when read from left to right?
- A) 30 B) 36 C) 42 D) 48
13. What is the value of 1% of 10% of 100?
- A) 0.01 B) 0.1 C) 1 D) 10
14. If three cats can eat three bowls of food in three minutes, how many minutes will it take 100 cats to eat 100 bowls of food?
- A) 1 B) 3 C) 100 D) None of the above
15. There are three squares. The area of the smallest one is 2. The side-length of the second square is twice the side-length of the smallest one. And the side-length of the third square is three-times the side-length of the smallest one. The total area of the three squares is
- A) 12 B) 28 C) 36 D) 72
16. A man, who had been married for three years, spent $\frac{2}{5}$ of his yearly income on his family, $\frac{1}{4}$ on business, and $\frac{1}{10}$ on personal travel. If he saved \$45000 during those three years, what was his annual income?
- A) \$45000 B) \$50000 C) \$65000 D) None of the above
17. Given four different integers, at most how many different sums can be formed by choosing two, three, or four of them and finding each sum?
- A) 8 B) 9 C) 10 D) 11
18. Max places 100 eggs in 10 baskets, with each basket receiving at least 1 egg, but no 2 baskets receiving the same number of eggs. What is the greatest number of eggs that may be placed in a basket?
- A) 45 B) 47 C) 55 D) 65
19. $2 + 3 \times 4 - 5 =$
- A) 0 B) 6 C) 9 D) 15
20. What is the highest power of 2 that divides $2 \times 4 \times 6 \times 8 \times 10$?
- A) 2^5 B) 2^7 C) 2^8 D) 2^{15}
21. Which of the following is a prime number?
- A) 2017 B) 2018 C) 2015 D) 2016
22. What is the greatest possible number of acute angles in a figure consisting of a triangle and a line passing through two sides of the triangle?
- A) 5 B) 6 C) 7 D) 8



23. Amy can solve 5 questions every 3 minutes. Kate can solve 3 questions every 5 minutes. How many more questions Amy can solve than Kate in one hour?
 A) 15 B) 32 C) 60 D) 64
24. Using 3 Ts and 2 Js, in how many different orders can the five letters be arranged? For example, TTTJJ and TTJJT are two such different orders.
 A) 2 B) 10 C) 20 D) 60
25. Coastal Coconuts can divide all their coconuts evenly among 8, 9, or 10 customers, with 1 coconut left over each time. If Coastal Coconuts has more than 1 coconut, what is the least number of coconuts they could have?
 A) 561 B) 721 C) 831 D) None of the above
26. $3^5 \div 3^2 =$
 A) 3 B) 9 C) 27 D) 81
27. If the sum of three prime numbers is 30, what is the least prime number?
 A) 2 B) 3 C) 5 D) 7
28. Juxtaposing two identical squares to form a rectangle, the perimeter of the rectangle is 12 less than the sum of the perimeter of the two squares. What is the side-length of the original square?
 A) 3 B) 6 C) 9 D) 12
29. It takes Mike 2 hours to finish a task. It takes 4 hours for Tom to finish the same task. Mike and Tom worked together on this task for one hour before Mike had to leave. How long will it take Tom to finish the rest of the task?
 A) 1 B) 2 C) 3 D) 4
30. The number of triangles in the figure on the right is
 A) 9 B) 10 C) 11 D) 12
31. What is the thousands digit of the product $1234560 \times 2345670 \times 3456780$?
 A) 8 B) 6 C) 5 D) 0
32. The sum of nine consecutive positive integers is always divisible by
 A) 2 B) 5 C) 7 D) 9
33. You can put as many as 96 books in 6 backpacks. How many backpacks are necessary for 144 books?
 A) 7 B) 8 C) 9 D) 10
34. The number of nickels I have is twice the number of dimes I have, and together these coins are worth more than \$1. The least number of dimes that I can have is
 A) 5 B) 6 C) 8 D) 10
35. The ages of four kids are four consecutive positive integers. The product of their ages is 3024. How old is the oldest kid?
 A) 8 B) 9 C) 10 D) 11
36. In the Game of Life, you earn 3 points for flipping a coin to “heads”, and 5 points for flipping a coin to “tails”. In all, how many positive whole number scores are IMPOSSIBLE to get after flipping it one or more times?
 A) 4 B) 5 C) 7 D) 11



37. Four monkeys can eat four bags of peanuts in three minutes. How many monkeys will it take to eat 100 bags of peanuts in one hour?
- A) 4 B) 5 C) 20 D) 100
38. The tens digit of the product of the first 100 positive integers is
- A) 2 B) 4 C) 8 D) 0
39. Someone put three dimes into my pile of quarters. If I add up the value of these coins, including the dimes, the sum could be
- A) \$6.25 B) \$7.75 C) \$8.05 D) \$9.50
40. Brooke's empty tub fills in 20 minutes with the drain plugged, and her full tub drains in 10 minutes with the water off. How many minutes would it take the full tub to drain while the water is on?
- A) 12 B) 15 C) 20 D) 30



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四年级试卷答案

| | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|
| 题号 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 答案 | C | B | B | A | D | B | C | B | B | B |
| 题号 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 答案 | C | B | B | B | B | D | D | C | C | C |
| 题号 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 答案 | A | C | D | B | D | C | A | B | A | D |
| 题号 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 答案 | B | D | C | B | B | A | B | D | C | C |