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2025-2026 Math League Preliminary Round

(Grade 6)

(Unofficial version, for reference only)

1. The ones digit of $9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$ is

   A) 0 B) 2 C) 4 D) 8

2. A fiddler played the same song 15 times in an hour without breaks. It took him ? minutes to play it twice.



   A) 4 B) 6 C) 7.5 D) 8

3. $\frac{5}{50} \times \frac{50}{500} \times \frac{500}{5000} \times \frac{5000}{50000} =$

   A) $\frac{1}{5}$ B) $\frac{1}{10}$ C) $\frac{1}{50}$ D) $\frac{1}{10000}$

4. What is the smallest positive integer that has 3 different divisors that are perfect squares?

   A) 36 B) 144 C) 225 D) 576

5. How many 0s does the simplified product $100^{2024} \times 100^{2025}$ have?

   A) 4049 B) 4051 C) 8096 D) 8098

6. For how many of the first 20 positive integers does the square of the integer equal the cube of an integer?

   A) 0 B) 1 C) 2 D) 3

7. If the ratio of a rectangle's length to its width is 3:2, what is the ratio of the rectangle's perimeter to the length of its longest side?

   A) 2:1 B) 3:2 C) 9:4 D) 10:3

8. I added 100 ml of iced tea to 500 ml of a lemonade-iced-tea mix that was 30% lemonade. What percent of the mix is lemonade now?

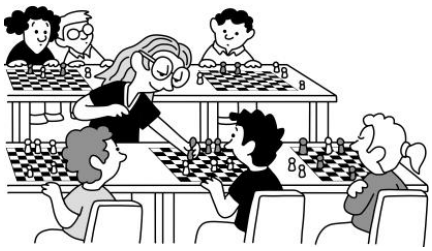


A) 18% B) 25% C) 36% D) 50%

9. The degree-measure of the largest angle of a right triangle is the sum of the squares of two positive integers. What is the difference between the squares of these two positive integers?

A) 45 B) 54 C) 63 D) 72

10. Each year Eve plays one more game than the year before. For 3 years in a row, Eve won, on average, 12 games a year. If Eve lost 20% of her games those 3 years, how many games did she play the third year?



A) 14 B) 15 C) 16 D) 17

11. How many positive multiples of 2^5 are less than 2^{10}?

A) 4 B) 29 C) 30 D) 31

12. The product of my 4-digit passcode and all of its 4 different digits (the product of 5 numbers) is a positive number less than 50 000. What is the greatest possible digit of my passcode?

A) 6 B) 7 C) 8 D) 9

13. If the difference between the smallest positive odd divisor and the greatest odd divisor of a positive even integer is 500, what is the smallest possible value of this even integer?

A) 502 B) 1000 C) 1002 D) 1004

14. What is the product of 2025 and all 15 of its positive integer factors?

A) 2025^7 B) 2025^8 C) $2025^7 \times 15$ D) $2025^8 \times 45$

15. How many digits are in the product $2^{2024} \times 5^{2025}$ when it is written in decimal form?

A) 2024 B) 2025 C) 2026 D) 4049

16. If twice my age minus 9 years equals half my age plus 9 years, what is my age?

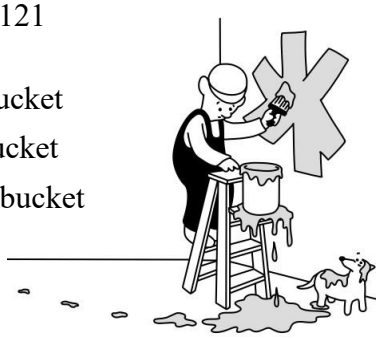
A) 99 years B) 18 years C) 12 years D) 9 years

17. What is the ones digit of 2024^{2025}?

A) 0 B) 4 C) 6 D) 9

18. If x and y are integers, I cannot write $\underline{?}$ as the sum of 8^x and 9^y.

A) 120 504 B) 321 193 C) 564 209 D) 6 880 121



19. There are two holes in my bucket! With these two holes a full bucket will drain in 60 minutes. When it just had the first hole, a full bucket drained in 100 minutes. How many minutes would it take a full bucket to drain if it only had the second hole?

A) 20 B) 80 C) 140 D) 150

20. In how many different ways can the letters in SUNDAY be arranged so that the S and the U are not next to each other?

For example, the letters in SUNDAY can be arranged to NSDAYU so that S and U are not next to each other.

A) 300 B) 360 C) 380 D) 480

21. How many different combinations of 3 even numbers could be the side-lengths of a triangle with a perimeter of 40?

For example, 18, 18 and 4 can be the side-lengths of a triangle with a perimeter of 40.

A) 4 B) 8 C) 9 D) 13

22. Positive integer x has exactly 7 whole-number factors. The product of these 7 factors is

A) x B) x^3 C) $x^3\sqrt{x}$ D) x^7

23. If w workers can paint c identical cars in h hours, how many hours does it take $3w$ workers to paint $4c$ cars that are identical to the c cars?

A) $\frac{3h}{4}$ B) $\frac{4h}{3}$ C) $2h$ D) $\frac{16h}{9}$



24. Ike's 5 identical iron pans weigh 23 kg more in total than his 4 identical steel pans weigh in total. If 2 of the iron pans and 3 of the steel pans weigh a total of 15 kg, 4 of the iron pans have a total weight that is $\underline{?}$ kg more than the total weight of 17 of the steel pans.

A) 1 B) 2 C) 10 D) 24

25. The sum of all positive integers from n through $3n$ is

A) $2n^2 - 2n$ B) $4n^2 + 4n$ C) $4n^2 - 2n$ D) $4n^2 + 2n$

26. If $x \neq 0, y \neq 0, x \neq y$, and $\frac{y}{x} - \frac{x}{y} + \frac{1}{x} - \frac{1}{y} = 0$, what is the value of $x + y$?

A) -2 B) -1 C) 0 D) 1

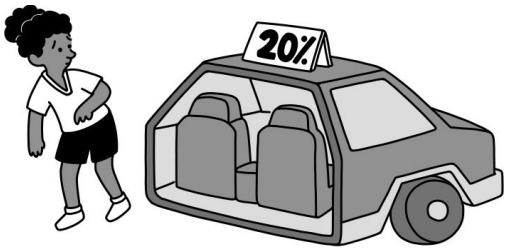
27. Robinson's cruise was so boring that he entertained himself by multiplying all the integers from 1 to 2025, and making a mark on a coconut for each factor of 5 in the product. How many marks did he make?



A) 405 B) 486

C) 502 D) 505

28. During a special sale at a car dealership, the price of a car was reduced each day by 20% of its price the day before. If the third discount was \$3840, what was the sum of the first three discounts?



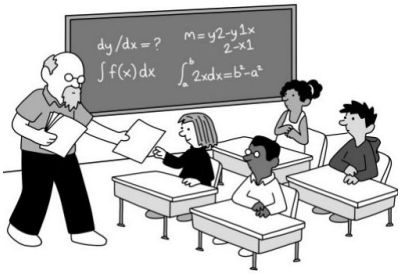
A) \$10 800 B) \$14 640

C) \$15 360 D) \$19 640

29. How many different ordered pairs of positive integers, (a, b), satisfy $ab = 25^{2025}$ and $a < b$?

A) 2024 B) 2025 C) 2026 D) 3037

30. At my school, only juniors and seniors are taking calculus. On the last exam, the average score of the 55 juniors was 72, the average score of the seniors was 80, and the overall average was 75. How many seniors are taking calculus?



A) 22 B) 33 C) 35 D) 88

31. What is the smallest three-digit number that can be written as the product of two consecutive positive integers?

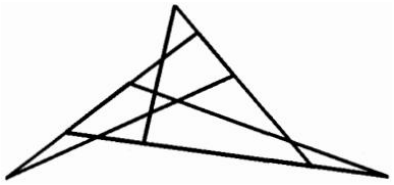
32. For $n > 1$, $n!$ represents the product of the first n positive integers. What is the only positive integer n for which $n!$ is a prime number?

33. If 1 000 000 were written as the product of two positive integers, neither of which contains the digit 0, what would be the value of the larger of these two integers?

34. From 10 cards numbered from 1 through 10, 2 cards are chosen at random, without replacement. Determine, as a fraction in lowest terms, the probability that the larger number is greater than 5.

    Note: "without replacement" means that the 2 cards are picked at the same time.

35. How many triangles are formed when six lines are drawn on a piece of paper so that every line intersects every other line, and no three lines intersect at the same point?



Answers										
Question	1	2	3	4	5	6	7	8	9	10
Answers	**A**	**D**	**D**	**A**	**D**	**C**	**D**	**B**	**D**	**C**
Question	11	12	13	14	15	16	17	18	19	20
Answers	**D**	**A**	**C**	**D**	**B**	**C**	**B**	**A**	**D**	**D**
Question	21	22	23	24	25	26	27	28	29	30
Answers	**B**	**C**	**B**	**A**	**D**	**B**	**D**	**B**	**B**	**B**
Question	31	32	33	34	35					
Answers	**110**	**2**	**15625**	$\frac{7}{9}$	**20**					