RMSMC

Redmond Middle School Math Club

2526M - A

2025-2026 MATHCOUNTS Exam

Monday, January 12, 2026

INSTRUCTIONS

1. DO NOT BEGIN THIS EXAM UNTIL YOUR PROCTOR TELLS YOU.
2. This is a thirty question SHORT ANSWER test. All answers must be recorded in the correct location on the separate answer sheet.
3. SCORING: You will receive 1 point for each correct answer, 0 points for each problem left unanswered, and 0 points for each incorrect answer. Ties will be broken for top placement positions based on the highest numbered question answered correctly. If students are still tied, the process is repeated for the remainder of questions in reverse order. Exact ties will be broken at the sole discretion of the Math Club chair.
4. No aids are permitted other than scratch paper, graph paper, rulers, compass, protractors, and erasers. No calculators, smartwatches, or computing devices are allowed. No problems on the test will require the use of a calculator.
5. Figures are not necessarily drawn to scale.
6. Units are not necessary unless the question asks for time, where AM or PM should be specified.
7. Give all answers in simplest form, rationalizing the denominator if necessary. If you get a fractional answer, express it as a common fraction unless otherwise indicated. If the answer is dealing with money, then round to the nearest hundredth.
8. Please make sure to write your name where indicated.
9. When your proctor gives the signal, begin working on the problems. You will have 40 minutes to finish your exam.
10. When you finish the exam, please go over your answers again to check your work.

Questions for this exam were authored by Emma Li and Jian Li.

ANSWER SHEET

Name	Score 1	Score 2	Final
Grade	Initial 1	Initial 2	

Do not write in shaded regions.

	Answer	1 or 0	1 or 0
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
1-15 Total			

	Answer	1 or 0	1 or 0
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
16-30 Total			

1. A rectangle has length 10 mm and width 12 cm. If the length is doubled and the width is halved in size, what is the area of the new rectangle in squared cm?

2. How many integers n are there such that $1/2026 < 1/n < 1$?

3. In a bag, there are 12 blue marbles, 5 red marbles, 17 purple marbles. What is the probability that you draw, without replacement, a red and a purple marble?

4. Simplify: $5 + 2(10 - 7)^2$

5. Jonathan needs to go to the grocery store, the dry cleaners, the video store and the post office. In how many different orders can he run these four errands?

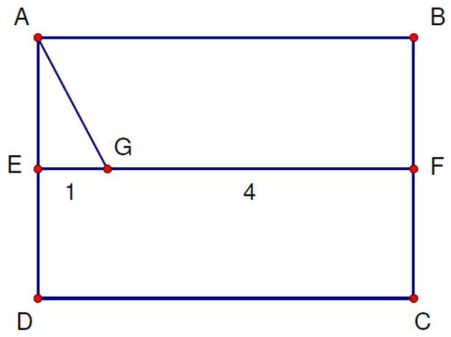
6. Andrew has 27 shirts. Each of them is a button up shirt or a blue shirt. If he has 18 button up shirts and 15 blue shirts, how many of them are both button up and blue?

7. Allison gets into an elevator and travels up 6 floors, then down 3 floors, then up 10 floors, then down 4 floors, then up 5 floors, then down 7 floors, then up 2 floors and then down 13 floors to the first floor. On which floor was Allison originally on when she first entered the elevator?

8. Which of the fractions below is the largest?

$$A: \frac{17}{35} \quad B: \frac{21}{43} \quad C: \frac{12}{25} \quad D: \frac{36}{73} \quad E: \frac{28}{57}$$

9. In rectangle ABCD shown below, points E and F are the midpoints of sides AD and BC, respectively. Point G lies on segment EF such that EG = 1 unit and GF = 4 units. What is the ratio of the area of triangle AEG to the area of the portion of rectangle ABCD that is not inside triangle AEG? Express your answer as a common fraction.



10. If the ratio of $2x - y$ to $x + y$ is $2/3$, what is the ratio of x to y? Express your answer as a common fraction.

11. If $y = 2x, z = 3y$ and $2x + 3y + 4z = kx$, what is the value of k?

12. What is the ratio of the measure of an interior angle of a regular pentagon to measure of an interior angle of a regular octagon? Express your answer as a common fraction.

13. Darwin has 20 kilograms of jellybeans. His plan is to eat 8 milligrams of jellybeans each day. Under this plan, for how many consecutive days could Darwin eat jellybeans? Express your answer in scientific notation.

14. What is the units digit when 1234567^{89} is expressed in decimal notation?

15. Peijin's pet turtle has a square plot of land that has an area of 20 yd^2. If Peijin doubles the length of each side of the square plot, how many square feet of land will his pet turtle now have in which to play?

16. If a rectangular prism has integer edge lengths and faces of area 24 cm^2, 32 cm^2, 48 cm^2, what is the volume of the prism in cm cubed?

17. How many different ways are there to arrange the letters in the word "REARRANGE"?

18. If Alice can finish an essay in 3 hours, Bob can finish in 6 hours, and Carl can finish in 4 hours, how long, in hours, would it take for them to write 3 essays together?

19. What is the absolute difference between the two roots of the function $f(x) = x^2 - 5x + 6$?

20. Amy wrote the numbers 1 through 111 on a board. How many times did she write the digit 1?

21. The clock on Jason's bedroom wall has a minute hand of length 8 inches and an hour hand with length 6 inches. How many inches farther does the tip of the minute hand travel in a 6 hour period compared to the tip of the hour hand? Express your answer to the nearest whole number.

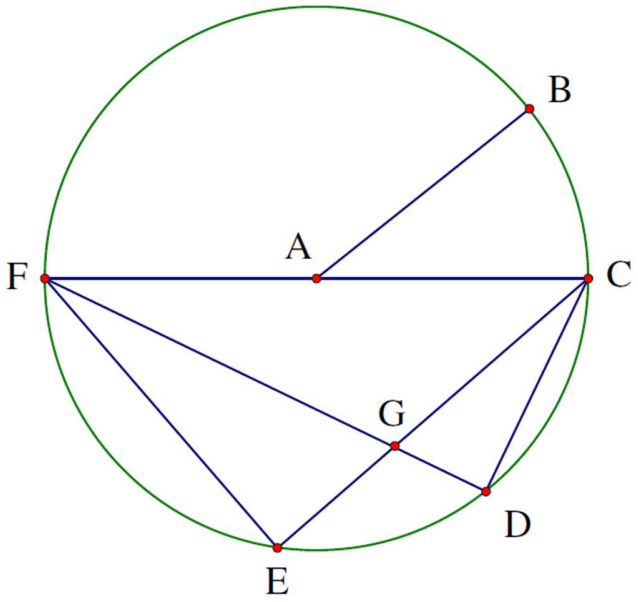
22. On a recent MATHCOUNTS tryout at MC Middle School, 40% of the boys scored higher than 30 and 60% of the girls scored higher than 30. If there were three times as many boys as girls participating in the tryout, what percent of all the students participating in the tryout scored higher than 30?

23. A town's population increases by 1200 people, and then this population decreases by 11%. After the decrease, the town has 32 less people than it did before the 1200 person increase. How many people were in the town's original population?

24. Several students each took the same exam. One group of ten students averaged an 80%. A second group, with twice as many students, averaged an 85%. A third group of students, which was composed of fifty percent of all students who took the exam, averaged an 90%. If every student is included in one of the three groups, what was the average percent of all the students in these three groups who took the exam? Express your answer to the nearest whole number.

25. In the Umpalumpa society there is no money. Instead, there is a system of trading so that all the Umpalumpas can get the goods they need. They can trade 9 Chumpawumpas for 7 Hopawopas. They can also trade 5 Hopawopas for 12 Pupawupas. Lastly, they can trade 15 Junkuwunkas for 14 Pupawupas. How many Chumpawumpas could you get in return for 16 Junkuwunkas?

26. Below, a circle with center A has radius AB equal to 5 units and FC as a diameter. If CD = 6 units and GD = 2 units, how long is FE? Express your answer as a common fraction in simplest radical form.



27. A cube with side length 12 inches is inscribed in a sphere. How many square inches greater is the surface area of the sphere than the surface area of the cube? Express your answer in term of π.

28. Carl puts up magnets of the numbers 1 to 8 on the board in a row, in any order. He then puts any of the operations +, -, *, / between every pair of adjacent numbers, and puts an equals sign at the end. What is the biggest result that he can make?

29. If m and n are positive integers such that $m^n = 64$, what is the sum of all distinct possible values of m * n?

30. In a 24-hour day, how many times will the hour hand and minute hand of an analog clock coincide?