

Pi Math Contest Fermat Division

First Round - 2026

INSTRUCTIONS

1. DO NOT OPEN THIS BOOKLET UNTIL YOUR PROCTOR TELLS YOU!
2. This is a 25-question test. Each question has an integer answer between 0 and 99.
3. Before the test begins, complete all information fields on the Answer Form. Write **FERMAT** in the division field.
4. Write your answers to problems 1-25 clearly in the designated boxes on the Answer Form. Write numbers only (integers 0-99) and do not include units, words, or symbols.
5. Do not write outside the answer boxes, as marks outside the boxes may interfere with grading. Only answers written in the designated boxes on the Answer Form will be graded.
6. SCORING: You will receive 10 points for each correct answer, 1 point for each problem left unanswered, and 0 points for each incorrect answer.
7. Only pencils, pencil sharpeners, and erasers are allowed. Calculators are not allowed.
8. Figures are not necessarily drawn to scale.
9. When your proctor gives the signal, begin working on the problems. You will have **40 minutes** to complete the test.
10. After the exam, return your **Answer Form, Test Booklet, and scratch papers** to your proctor.
11. You should NOT discuss any aspect of the exam questions with anyone until **April 6th**. Problems and solutions to the test will be posted on the contest website after April 6th.

1. What is the value of

$$33 - 3 \times 3 + 33 \div 3?$$

2. The ratio of two positive numbers is 3 to 5. If the difference between the two numbers is 64, what is the smaller number?

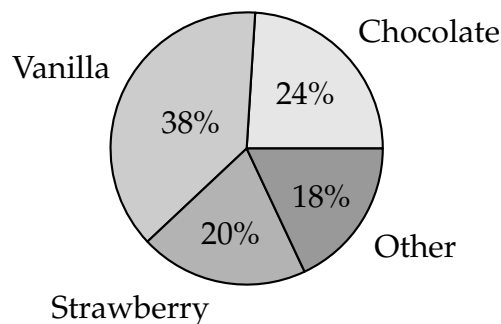
3. How many three-digit perfect squares are there?

4. Eight increased by three times a number is 77. What is the number?

5. What is

$$\frac{2^6 - 6^2}{6 - 2}?$$

6. The 8th grade students at Central Middle School were surveyed on their favorite flavor of ice cream. The results are shown in the pie chart below. Given that 36 students voted chocolate as their favorite flavor, how many students voted vanilla as their favorite flavor?



7. The AlphaStar store is selling ramen at a price of \$2.15. If the original price was \$2.50, what percent discount is being offered?

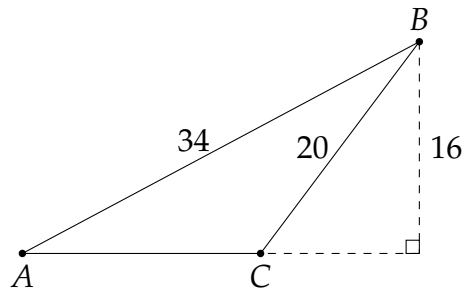
8. Clara purchased a ballpoint pen using three quarters and one dime, and received one nickel and two pennies in change. How many cents did the pen cost?
9. If $\frac{1}{6} + \frac{1}{10} = \frac{1}{5} + \frac{1}{n}$, what is the value of n ?
10. The mean height of six students is 64 inches. Given that five of the students' heights are 58, 61, 64, 65, and 65 inches, what is the height of the sixth student, in inches?
11. What is the value of $\frac{2^{26} \times 4^{15}}{8^{17}}$?
12. Each interior angle of a regular polygon measures 172° . How many sides does the polygon have?
13. The formula for converting temperatures from degrees Fahrenheit ($^\circ F$) to degrees Celsius ($^\circ C$) is $C = \frac{5}{9}(F - 32)$. The low and high temperatures in Phoenix, AZ on July 8, 2024 were $91^\circ F$ and $118^\circ F$, respectively. What is the difference, in degrees Celsius, between the high and the low temperatures that day?
14. A basketball conference has two divisions, each with six teams. During the season, each team plays every other team in its own division twice and each team in the other division once. How many total games are played in the conference during the season?
15. Stephen was asked to type $2963 + 48715$ on a calculator. He accidentally left out two digits, and obtained a sum of 5164 instead of the correct sum of 51,678. What is the product of the two digits that Stephen left out?

16. Kena counts backwards by 7's starting from 1000:

1000, 993, 986, 979, . . .

What is the first number that she counts that is less than 100?

17. What is the perimeter of $\triangle ABC$ in the figure below?



18. If $a \spadesuit b = (a - 2)(b - 2)$, what is the value of $1 \spadesuit (2 \spadesuit (3 \spadesuit (4 \spadesuit 5)))$?
19. A pizzeria offers six different toppings, including mushrooms and olives. Joshua will select three different toppings for his personal pizza. However, he dislikes the combination of mushrooms and olives, and will not select any set of toppings which includes both of these. How many different topping combinations can Joshua choose?
20. The two diagonals of a convex quadrilateral have lengths 16 and 10, and intersect at a 30° angle. What is the area of this quadrilateral?
21. How many integers n with $1 \leq n \leq 100$ have the property that $n^2 + n$ is divisible by 6?

22. A pair of prime numbers which differ by 4 are called *cousin primes*. For example, the pairs (3, 7) and (7, 11) are cousin primes. Alex writes down a pair of two 3-digit cousin primes and computes their sum. What is the largest integer that must be a factor of Alex's sum?
23. Fatima repeatedly flips a fair coin. The probability that she obtains her third head before her second tail is equal to $\frac{m}{n}$, where m and n are relatively prime positive integers. What is $m + n$?
24. The three sides of an isosceles triangle each measure a whole number of inches, and the perimeter of the triangle is 32 inches. Rounded to the nearest square inch, what is the greatest possible area of this triangle?
25. A quadrilateral has distinct integer side lengths that form a geometric sequence. What is the smallest possible perimeter of the quadrilateral?