

VAMO 2026 Team Round

Written by the VAMO Team



INSTRUCTIONS

1. **Do not open this packet until the proctor directs you to.**
2. For the Team Round, you will have 50 minutes to answer 20 free response questions (and 3 estimation problems).
3. Be sure to mark all answers on the Answer Sheet along with your name. This is the page that will be collected and scored.
4. For the non-estimation problems, you will receive 1 point for each correct answer and 0 points for each incorrect answer, for a maximum of 20 points.
5. For the estimation problems, the team(s) closest to the answer will receive 1 point each. Other teams will receive 0 points.
6. No problems will require the use of a calculator. Permitted aids include and are limited to scratch paper, graph paper, rulers, compasses, protractors, and erasers. No calculators, smartwatches, or computing devices are allowed.
7. Figures are not necessarily drawn to scale.



Van Antwerp Math Olympiad 2026

Team Round Answer Sheet

Names of team members: _____

1. _____ 2. _____ 3. _____ 4. _____ 5. _____

6. _____ 7. _____ 8. _____ 9. _____ 10. _____

11. _____ 12. _____ 13. _____ 14. _____ 15. _____

16. _____ 17. _____ 18. _____ 19. _____ 20. _____

21. _____ 22. _____ 23. _____

VAMO 2026 Team Round Problems

Problem 1

If $a * b = \frac{6}{b} + 3a$, then $2 * 3 = \frac{6}{3} + 3(2) = 8$. What is $4 * (1 * 2)$?

Problem 2

What is the smallest positive integer that is divisible by 2, 3, and 4?

Problem 3

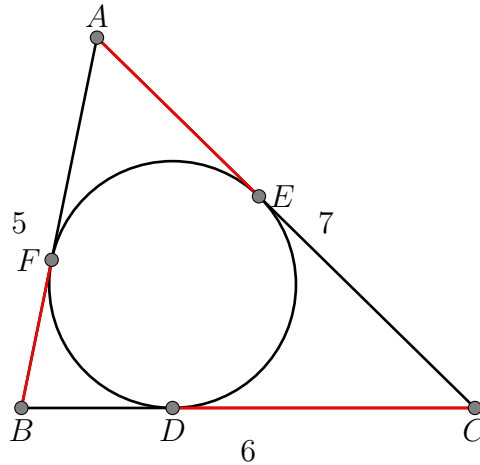
Brian buys Pokemon[™] card packs at a price of 10 packs for 50 dollars and sells them at a price of 8 packs for 90 dollars. How many packs will he have to sell to make a \$1000 profit?

Problem 4

How many distinct permutations of the letters of the string “VAMO” do not have the two vowels next to each other?

Problem 5

Let triangle ABC have side lengths $AB = 5$, $BC = 6$, and $CA = 7$. Let circle Ω be inscribed inside $\triangle ABC$. Let it be tangent to BC , CA , and AB at points D , E , and F respectively. What is $AE + CD + BF$?



Problem 6

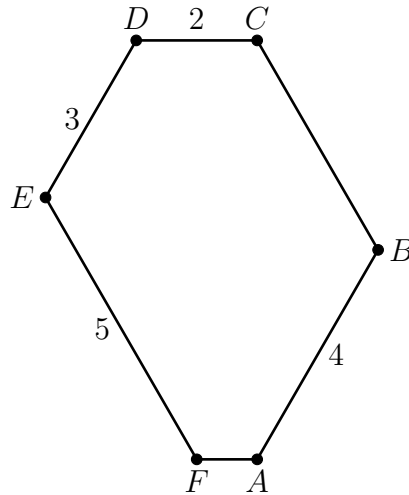
How many 3-digit positive integers are divisible by 9?

Problem 7

Eighty-eight less than the square of a number is equal to the square of the quantity that is 4 less than the number. What is the number?

Problem 8

Let hexagon $ABCDEF$ be equiangular. Let $AB = 4$, $CD = 2$, $DE = 3$, and $EF = 5$. Calculate the area of $ABCDEF$.

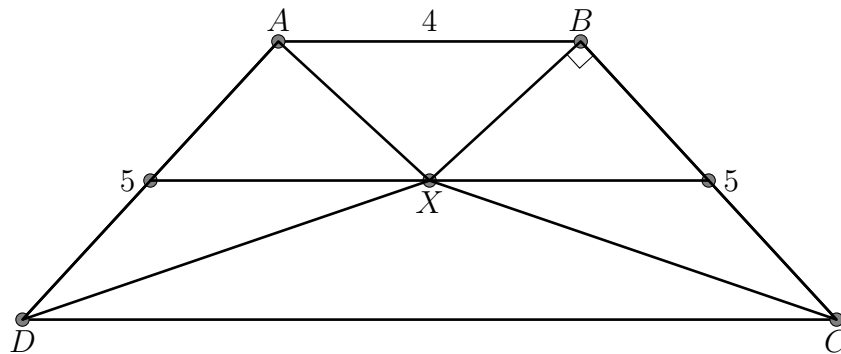


Problem 9

Brian has a gambling addiction. Every day, he spends 2 dollars to buy a lottery ticket. On any given day, there is a 15 dollar prize that can be won with a probability of $\frac{1}{10}$. Brian continues until he wins the prize. On average, how much money will he lose?

Problem 10

The isosceles trapezoid $ABCD$ has bases $\overline{AB}$ and $\overline{CD}$, with $AB < CD$. Suppose $AB = 4$ and $BC = DA = 5$. Let the midpoints of BC and DA be E and F , respectively. Let the midpoint of EF (the midline) be X . It is given that $\angle XBC = 90^\circ$. What is the length of $\overline{CD}$?



Problem 11

What is the smallest positive integer that has exactly 18 positive divisors?

Problem 12

There are 8 chairs in a row. There are 4 boys and 3 girls. Two of the boys must sit next to each other and refuse to sit next to girls. On the other hand, the other two boys, Arjun and Andrew, think differently. Arjun does not care whether he sits next to a girl or a boy while Andrew will only sit with two girls immediately to his left and right. How many ways can the 7 people sit down in the 8 chairs (leaving 1 chair empty)? The boys and girls are distinguishable.

Problem 13

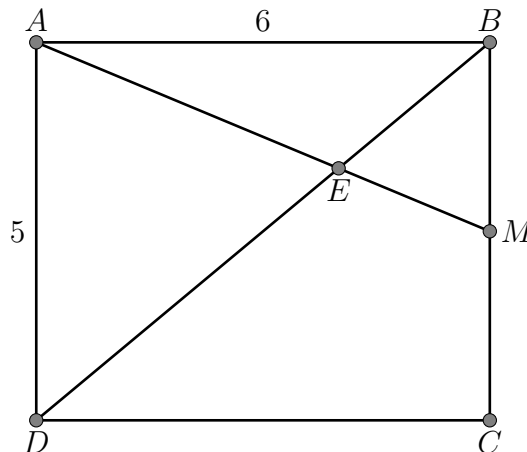
Let $f(x) = \frac{x}{\sqrt{1+2x^2}}$. Let the function $f^{(1)}(x) = f(x)$ and $f^n(x) = f(f^{n-1}(x))$ for $n \geq 2$. The value of $f^{(39)}(\frac{1}{\sqrt{3}})$ can be written as the fraction $\frac{p}{q}$, where p and q are relatively prime. Find $p + q$.

Problem 14

Mia has 5 distinguishable coins that she wishes to stack on top of one another. Each face has a star on one side but nothing on the other side. How many ways can she stack the coins so that no two adjacent coins have stars that are face to face?

Problem 15

Let rectangle $ABCD$ have side lengths $AB = 6$ and $AD = 5$. Let M be the midpoint of $\overline{BC}$. Let the intersection of $\overline{AM}$ and $\overline{BD}$ be E . Find the length of $\overline{AE}$.

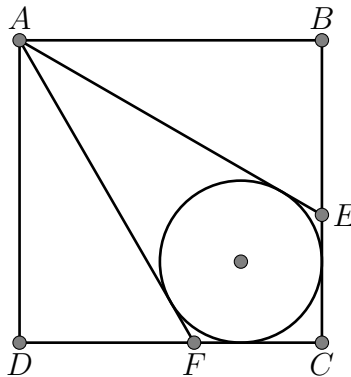


Problem 16

Ronny is writing positive integers on a board, starting from 1 and counting up consecutively. However, he refuses to write the digits 6 or 7, so he skips any number containing them. For example, after writing 159, the next number he writes is 180. When Ronny writes the number 1013, how many numbers has he actually written on the board?

Problem 17

Let $ABCD$ be a square with side length 3. Define points E and F on sides BC and CD , respectively, such that $\angle BAD$ is trisected by lines $\overline{AE}$ and $\overline{AF}$. Let circle Ω be tangent to $\overline{AE}$, $\overline{AF}$, $\overline{BC}$, and $\overline{CD}$. Find the radius of circle Ω .



Problem 18

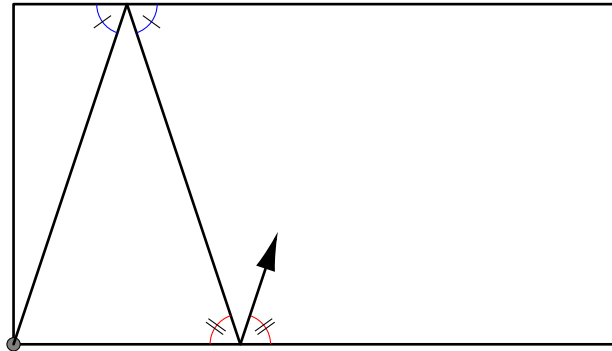
Ava and Hazel go to Proctors Theatre on the same day. Each shows up separately at a random time between 6:00 pm and 10:00 pm. Ava stays for 1 hour, whereas Hazel stays for 2 hours. Given that there does not exist a team where Ava and Hazel were at Proctors Theatre, what is the probability that Ava was at the Theatre at 9:00 pm?

Problem 19

Let x, y and z be positive, real numbers that sum to 2. Find the maximum value of $x^4 y^3 z$.

Problem 20

A screensaver is played on a 9-inch by 16-inch rectangular computer screen (where the 9-inch sides are vertical). An infinitely small ball begins at the bottom right corner of the screen. Initially, the point travels diagonally with a slope of 3, moving at a constant speed of one inch per second. Every time the point hits a side, it bounces off, leaving at the same angle it approached with. How long will it take for the point to reach another corner?



Problem 21 (Estimation)

How many of the first 20 problems in this team round do you think your team got right?

Problem 22 (Estimation)

What is the value, in dollars, of a stack of pennies that reaches the moon from earth?

Problem 23 (Estimation)

How many characters are in the VAMO 2026 Team Round Problems and Solutions file?