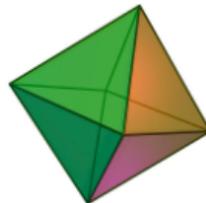


1. Find $2^0 - 1 \times 9$.
2. I have an 8×8 grid of chocolate squares. If I eat one row of chocolate, how many squares of chocolate do I have left?
3. Class #35 has 35 students and 1 teacher. They take a field trip to the apple orchard and each person picks 5 apples. However, 5 apples are rotten, so they throw those away, and take the rest back to school. How many apples did Class 35 take back to school?
4. Andy is playing on his calculator, but when attempting to divide by 3, he accidentally multiplies by 3 and gets 36. What is the positive difference between the answer Andy should have gotten, and the answer he got?
5. What is the smallest 3-digit number that is divisible by 11?
6. Sean, Jeffrey, Tanush, and Brian all wish to see a show, but they only have two tickets. In how many ways can they decide who goes to the show?
7. 8 moles dig 4 holes in 2 minutes. How many holes can 4 moles dig in 10 minutes?
8. There are 3 people waiting in line (Abby, Billy, and Carl). How many ways can these 3 people be arranged such that Abby is always ahead of Carl?
9. What is the second smallest positive whole number divisible by 2, 3, and 4?
10. A lily is in a pond, and each day the lily grows. More specifically, the area that the lily takes up in the pond doubles after every day. If it takes 32 days for the lily path to cover the entire lake, how many days would it take for it to cover half of the lake?
11. A triangle with an area of 5 and a square with an area of 7 overlaps with a certain area. If the area of the triangle outside the overlapping area is 3, then what is the area of the square outside the overlapping area?
12. Suppose you have an octahedron of side length 1, which is a polyhedron with eight faces, twelve edges, and six vertices:



Suppose I start at the top of the octahedron, and I have to move to the bottom vertex of the octahedron. It takes 1 second to travel along each edge, and I can only travel along edges. How many ways are there to reach the bottom vertex starting from the top vertex, in exactly 3 seconds?

13. How many ways are there to create a 4-letter word using the letters M, A, T, and H, given the first letter is either M or T and that all the letters are distinct? **It does not have to be a real word in the English language.**
14. Before half-time, Tanush shoots 15 3-pointers and makes 1 of them. If after half-time, Tanush doesn't miss, how many more 3-pointers will he have to shoot to raise his shooting percentage to at least 30%?
15. Define the function $a!b = a \times b + 3$. Find x if $(2!x)!3 = 66$.
16. Nathan, Parth, Tanush, Richard, and Sean go to dinner together. They each agree to pay $\frac{1}{5}$ of the bill, but Sean forgot his money! Parth, Tanush, Richard, and Nathan agree to pay an extra 3.25 to cover Sean's part of the bill (it was also his birthday). What was the total cost of the bill?

17. 25% of a class is 20 years old, $\frac{1}{3}$ of the people in the class are 21 years old, and the rest of the people in the class are 22 years old. Given that there is the least number of possible 22-year-olds in the class that could satisfy these conditions, how many ways can the teacher make a single group of one person of each age?
18. On a particular day, denote a happiness index h that is determined by the day of the week it is. That is, Monday $\rightarrow h = 1$, Tuesday $\rightarrow h = 2$... Sunday $\rightarrow h = 7$. In the month of February on a non-leap-year, what is the maximum possible sum of happiness indexes?
19. The product of two positive real numbers is equal to twice their quotient. What value must one of the numbers be?
20. Tanush's pool is a rectangle with dimensions $N \times 2N$. Then, the border has dimensions $(N + 2) \times (2N + 2)$. If the border has an area of 40 (not including the pool's area), what is the area of the pool?
21. In the geometric sequence 2, 12, 72,.... which term number (such as "4th term") has a total of 90 factors?
22. Alice and Bob each have apples. On Day 1, Alice gives Bob 40% of her apples. On Day 2, Bob gives Alice $\frac{1}{2}$ of his apples. Alice then comments she has 5 more apples than she started with. Given Bob starts with 100 apples, how many apples did Alice start with?
23. How many factors does the product of all factors of 6^4 have?
24. Let the incircle of triangle ABC be tangent to sides BC , AC , and AB at points D , E , and F respectively. Given that $AE = 7$, $CD = 8$, and $BF = 6$, compute the length of the altitude from A to BC .
25. If the first Fibonacci number is 1, the second Fibonacci is also 1, the 20th Fibonacci number 6765, and the 21st Fibonacci number 10946, what is the sum of the first 20 Fibonacci numbers?