1. Following the order of operations, the equation simplifies to and this equals 16.

2. David can write 8 problems in 3 hours, so he can write 8/3 problems in 1 hour. In 384 hours, he can write problems, or 1024 problems.

3. Notice that we can group the first 100 whole numbers into 50 pairs, pairing 0 with 99, 1 with 98, and so on. The sum of each of these 50 groups is 99, so the sum of the first 100 whole numbers is 4950.

4. The GCF and LCM of 240 and 96 are 48 and 480, respectively. Summing these yields 528.

5. There are 31 days in December and 31 days in January. And

6. An equilateral triangle with side length 7 can be split into two 30-60-90 triangles with leg lengths and and hypotenuse length 7. The area of one of these triangles is , so the area of the equilateral triangle is

7. We can group the numbers into 5 pairs, pairing 1 and 10, 2 and 9, and so on. The sum of each of these groups is 11. So, the sum of these numbers is the sum of these groups, or 55.

8. There are 3600 seconds in an hour. 25200 dabs/hour 1 hour/3600 seconds is equivalent to 7 dabs/second since

9. Adding the positive proper divisors of 90, yields 144. The positive proper divisors of a positive integer are all the positive divisors of a positive integer excluding the integer itself.

10. The sum of the exterior angles of any convex polygon is 360 degrees.

11. Notice that 1280 is equivalent to The even factors are and We can combine these factors into which yields 3060.

12. is merely Plugging in 4 and 21 into simplifies to From our Pythagorean Triples, we know that . So,

13. We can factor 101 out of the first three terms, resulting in and this can be further simplified as and adding 1 yields 13737.

14. The first 5 odd prime numbers are 3, 5, 7, 11, 13. Summing these yields 39.

15. The sum of the angles in a quadrilateral sum to 360 degrees. If three angles measure 70 degrees, then the fourth angle measures degrees, or 150 degrees.

16. You can count the number of diagonals in a convex hexagon or use where represents the number of diagonals in a convex -gon with There are 9 diagonals in a convex hexagon.

17. Summing the terms in the set yields 417 and dividing by 3 yields 139. Or notice that we can divide each term by 3 then sum them together.

18. 1 bruh is equal to 4 bros, bois, and boiz. 18 bruhs is consequently equal to 224 boiz.

19.WLOG, if I choose Character A, the probability that Jack chooses Character A is .

20. There are 4 entrees, 3 snacks, and 3 beverages to choose from. There are 4, 3, and 3 combinations to pick an entree, a snack, and a beverage, respectively. yields 36.

21. The functions and can be modeled as c and Noticing that then yields can be simplified as which yields 10.

22. Realize that at some point in the expression exists. Since the expression is equal to 0.

is defined for all integers except when Notice that consequently when Therefore

24. The remainder of when divided by 100 is the same as multiplying the remainder when and are divided by 100, which are 64 and 44 respectively. The remainder of the product of 64 and 44 when divided by 100 is 16.

25. The probability that two of them accept and one of them does not is which equals We multiply by 3 since there are 3 combinations to have 2 of my friends join me out of the three of them.

26. Notice that x can be split into two separate expressions, and The first expression is equal to . The second expression is equal to 144, but with the in the question we can decrease the value of one of the expressions by 24, in this case the second one, yielding 120 or .

27. If Auska uses his phone for 20 minutes, it will have of its battery left. Charging for 3 minutes will add to the amount of battery it has left, so it will have of its battery left. of its battery will only let Auska use his phone for 16 minutes since his phone uses of its battery every minute. Auska can use his phone for a total of 36 minutes.

28. There will be 2 solutions to this problem, the first is pure multiplication and addition (which is possible) and the second is with some select formulas.

1. The first solution is straightforward, summing and yields 3465.

2. For the second solution, notice that the sum of and is equal to the sum of the 10 smallest positive integers, 10 smallest positive perfect squares, and 10 smallest positive perfect cubes. Summing the 10 smallest positive integers yields 55. Summing the 10 smallest positive perfect squares is a little trickier, so we will need to use the function where s(n) represents the sum of the n smallest positive perfect squares. Using this, the sum of the 10 smallest positive perfect squares is 385. Summing the 10 smallest positive perfect cubes can also be found using the function , where c(n) represents the sum of the n smallest positive perfect cubes. Using this, the sum of the 10 smallest positive perfect squares is 3025. Summing 55, 385, and 3025 yields 3465.

29. The area of a square is found by squaring its side length, and is equal to 7225.

30. Dylan can eat 54, 53, 52, 51,... and 42 nuggets, but he cannot eat 41 nuggets. We can also use the Chicken McNugget Theorem, which states that when and are relatively prime positive integers, the greatest positive integer that cannot be expressed as the sum of a multiple of and is equal to In this case,is or 41.

31. Moving the equation around we see that Further simplifying this equation leads to and satisfies that equation. But, -2 is an extraneous root since when it is plugged into it yields 8. So, is the only solution, and the sum of the solutions is 8.

32. The circumference of a circle is given by multiplying the circle’s diameter by (approx. 3.14). Rounding yields 47 (about 47.1).

33. Mia walks at or 420 meters in a minute, Rachel walks or 240 meters in a minute, and Melissa walks at 10 meters in a minute. In one minute, the total distance traveled by the three is or 670.

34. The -intercept of is since and the -intercept of is since Summing and yields

35. We can rearrange the inequality by using the reciprocals of each of the numbers and reversing each of the greater than signs. Now we can write the inequality as Simplifying this to the nearest tenth results in The number of primes between 101.1 and 106.3, exclusive, is 1 (103).

36. First, we need to find how much the bundles cost per frame. The bundle containing 1 frame costs $1, so 1 frame/$1. The bundle containing 3 frames costs $2.25, so 1 frame/$0.75. The bundle containing 8 frames costs $6.40, so 1 frame/$0.80. To minimize costs, one should buy the bundle containing 3 frames, so it seems like the cheapest option would be to buy 6 bundles containing 3 frames and 2 bundles containing 1 frame, costing a total of $15.50. However, notice that 20 is 8 more than a multiple of 3 and buying a bundle of 8 frames ($6.40) is cheaper than buying 2 bundles of 3 and 1 frames ($6.50). So, the cheapest option would be to buy 4 bundles containing 3 frames and 1 bundle containing 8 frames, costing a total of $15.40.

37. Kaitlyn can solve 354 problems in 3 hours, or 118 problems in 1 hour, and John can solve 5 problems in 1 minute, or 300 problems in 1 hour. In 1 hour, the two of them combined can solve 418 problems, so in 2 hours they can solve 836 problems.

38. First there are 9 choices for the hundreds digit since the only restriction is that 0 cannot be picked. There are also 9 choices for the tens digit even though 1 digit has already been picked because 0 can now be picked. There are then 8 choices for the ones digit since 2 digits have already been picked. So, the total number of positive three-digit integers that have distinct digits is or 648.

39. Trust me, the probability that the sum of the numbers by rolling n fair 6-sided die is even is when

For example, the probability that the sum of the numbers by rolling 1 fair 6-sided die is even is If the sum of the die is even or odd, then we call them Even-sum or Odd-sum, respectively. Given that the sum of the numbers by rolling 1 fair 6-sided die has an equal chance of being an Even-sum or Odd-sum, there is a chance the next die rolled will result in an Even-sum. (this definitely makes sense)

40. 1+1 is probably 2... (trust me on this one)