

- _____ 1. Evaluate $1 + 3 \div 2 + 5 \cdot 2 + 1 \div 2 + 3$.
- _____ 2. Test writing is quite hard, and if David can write 8 problems in 3 hours, then how many problems can David write in 384 hours?
- _____ 3. Find the sum of the first 100 whole numbers.
- _____ 4. Find the sum of the greatest common factor and least common multiple of 240 and 96.
- _____ 5. This will be a nice problem, how many days are in December and January combined?
- _____ 6. What is the area of an equilateral triangle with side length 7?
- _____ 7. Find $1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10$.
- _____ 8. People do not like it when I dab, and that is very sad. On average, how many times do I dab in one second if I dab 25200 times in one hour?
- _____ 9. Find the sum of the positive proper divisors of 90.
- _____ 10. What is the sum of the exterior angles of a convex pentagon in degrees?
- _____ 11. Find the sum of the even factors of 1280.
- _____ 12. Given the function $f(x) = x^2 + 6x$, compute $f(4) + f(21)$.
- _____ 13. Find $6767 + 4646 + 2323 + 1$.
- _____ 14. Find the sum of the first five odd prime numbers.
- _____ 15. If three angles of a quadrilateral measure 70 degrees each, what is the degree measure of the fourth angle?
- _____ 16. Find the number of diagonals a convex hexagon has.
- _____ 17. Find the average of the numbers in the set $\{54, 297, 66\}$.
- _____ 18. If 1 bruh equals 4 bros, 7 bois equals 3 bros, and 4 boiz equals 3 bois, how many boiz is 18 bruhs equal to?
- _____ 19. There are 40 characters to choose from in Big Brain Bros. Given that my friend Jack and I choose each character with equal probability, what is the probability we pick the same character?
- _____ 20. How many combinations of 1 entree, 1 snack, and 1 beverage can be chosen if there are 4 entrees, 3 snacks, and 3 beverages available?
- _____ 21. Given linear functions f and g satisfying $f(0) = g(0) = c$ and $f(5) = 0$, compute $f(10) + 10 + g(0) + 0$.
- _____ 22. Evaluate $(a - f)(b - f)(c - f) \dots (x - f)(y - f)(z - f)$.
- _____ 23. Given the function $f(x) = \frac{1}{x}$, compute $f^{2020}(2021)$.
- _____ 24. Find the remainder when $8^2 \cdot 12^2$ is divided by 100.
- _____ 25. I invite three friends, Cyrus, Jiayi, and Bruce to play some good games with me. If they each accept my invitation with probability $\frac{2}{3}$, what is the probability that exactly two of them will play some good games with me?
- _____ 26. If $x = 1!6! + 2!5! + 3!4!$, find $\frac{x-24}{5!}$.
- _____ 27. Auska's phone goes from full to empty in 30 minutes, but recharges in 15 minutes. How long can Auska use his phone until his phone runs out of battery if his phone starts at full battery, and he repeats a cycle of first using his phone for 20 minutes and then charging his phone for 3 minutes? Assume that Auska is not using his phone while it is charging and that his phone charges at a constant rate.
- _____ 28. If

$$x = 1 \cdot 3 + 2 \cdot 7 + 3 \cdot 13 + 4 \cdot 21 + 5 \cdot 31$$
 and

$$y = 6 \cdot 43 + 7 \cdot 57 + 8 \cdot 73 + 9 \cdot 91 + 10 \cdot 111,$$
 find the value of $x + y$.
- _____ 29. What is the area of a square with side length 85?
- _____ 30. Dylan eats nuggets either 7 at a time or 8 at a time, and this is the only way Dylan will eat his nuggets. What is the largest number of nuggets that he cannot eat while eating 7 or 8 at a time?

- _____ 31. Find the sum of the values of x which makes $f(x) = 0$, where $f(x) = \sqrt{2x + 20} - x + 2$.
- _____ 32. What is the circumference of a circle with diameter 15 rounded to the nearest whole number?
- _____ 33. Mia, Rachel, and Melissa love walking at superhuman speeds. Mia walks 7 meters in a second, Rachel walks 4 meters in a second, and Melissa walks 10 meters in a minute. Assuming they keep this pace, what is the combined number of meters that they walk if all three of them walk for 1 minute without stopping?
- _____ 34. Find the sum of the x -intercept and y -intercept of $f(x) = \frac{3}{7}x + \frac{5}{3}$.
- _____ 35. Assume that a and b are real numbers and that

$$\frac{20}{2021} > \frac{a}{b} > \frac{19}{2020}.$$

Find the sum of all prime values of $\frac{b}{a}$.

- _____ 36. Lindsay and Vera love taking pictures! They can buy picture frames in bundles of 1, 3, and 8 frames, with the bundles costing \$1.00, \$2.25, and \$6.40, respectively. If they want to minimize the amount of dollars spent buying frames, then how many dollars would they need to spend to get 20 frames?
- _____ 37. Kaitlyn and John use their math knowledge to work on their math homework. Kaitlyn can solve 354 problems in 3 hours and John can solve 5 problems in 1 minute. What is the combined number of problems that they can solve in 2 hours?
- _____ 38. How many positive three-digit integers have 3 distinct digits?
- _____ 39. Ayyyyy, the question before the last question! 100 fair 6-sided dice are rolled, what is the probability that the sum of the numbers rolled by the dice is divisible by 2?
- _____ 40. Ayyyyy, the last question! What is $1 + 1$?