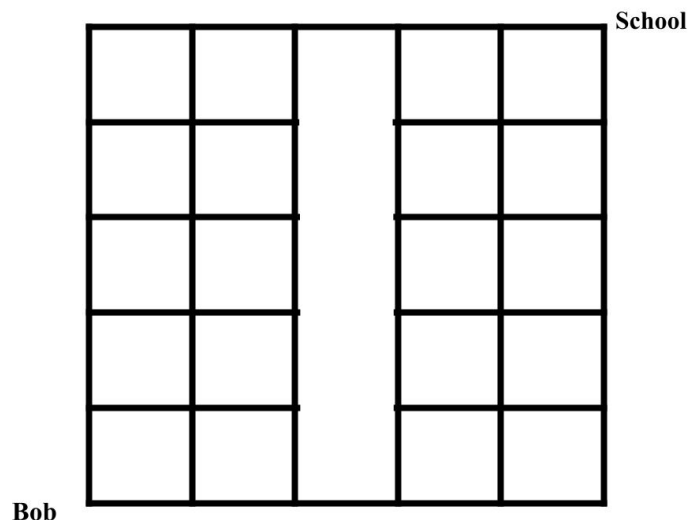


Magic Math Contest

1. _____ Bob feeds his dog 3 times a day. His dog eats $\frac{1}{2}$ a pound of dog food each meal. How many days can he feed his dog if he has 6 pounds of dog food?
2. _____ Evaluate $|46 - 97| - (-9)$.
3. _____ If $x + 20 = 3x + 10$, what is x ?
4. _____ Bob is delivering pencils. In his truck there are 22 crates. Inside each crate there are 14 boxes. Inside every box there are 13 pencils. How many total pencils is bob delivering?
5. _____ If the perimeter of a rectangle is 24, what is the maximum possible area of the rectangle?
6. _____ $2021 + x^2 = 2021$, what is x ?
7. _____ Cara has 12 more dolls than Mara, Mara has twice the number of dolls as Sara, and Sara has 15 dolls. How many dolls do the three girls have together?
8. _____ What is the probability that when a letter is picked at random from the letters of the word Mississippi, it is a vowel? Answer as a common fraction in simplest form.
9. _____ 2 hoses are filling a pool at a rate of 5 gallons a minute and 6 gallons a minute respectively. However, the filter is open and water is flowing into it at a rate of 100 gallons per hour. How many hours will it take to fill the pool if it holds 6160 gallons of water?
10. _____ How many multiples of 5 are between 44 and 91?
11. _____ What is the remainder when $7 \cdot 11 \cdot 13$ is divided by 8?
12. _____ Evaluate $(2+4+6+8+\dots+20) - (1+3+5+7+\dots+19)$.
13. _____ The number 3599 is the product of 2 prime numbers. Evaluate the sum of these two numbers.

14. _____ Using the numbers 1, 2, 3, and 4, you can make pairs of 2 digit numbers. For example, 12 and 34 are one pair or 13 and 24. These two numbers are then multiplied to come up with a product. What is the difference between the largest possible and smallest possible value of this product.
15. _____ A list of 7 distinct positive integers has a median of 7 and a mean of 7. What is the maximum possible value for the greatest number in this sequence?
16. _____ In the kingdom Atguar, there live three species, Lloret, Laxsier, and Ezealies. The animals can be any mixture of the species. So, for example, an animal could be a Lloret and a Laxier. If some Llorets are also Laxiers and no Laxiers are Ezealies, can an animal be a Lloret and an Ezealie? Put the answer as 0 if no, and 1 if yes.
17. _____ If $\gcd(a, b) = 4$ and $\text{lcm}(a, b) = 224$, what is ab ?
18. _____ A number is wonky if it has a remainder of 1 when divided by 3, 2 when divided by 5, and 3 when divided by 7. What is the 3rd smallest positive wonky number?
19. _____ The diagram below shows the blocks from Bob's home to school. He starts at the bottom left corner and travels up or to the right on the black lines to reach school. However, a road is between the house and school with only 2 crosswalks. Bob can only cross the road using the crosswalks and not from anywhere else. How many ways can Bob move to get to school?



20. _____ How many ways are there for 8 identical rocks to be distributed among 3 people?

Bonus Questions

21. _____ What is the largest prime number that divides $11^6 - 9^6$?
22. _____ A sector of a circle is folded to make a right circular cone. The cone has a height of 12 and a radius of 9. What is the central angle of the sector?