_____ **1.** Evaluate $202202 \div 22$.

_____ **2.** Find the area of the triangle with side lengths $3, 4, 5$.

_____ **3.** Bryan is giving out pieces of candy. He starts with x pieces of candy, gives half of the pieces to the first student, and gives half of what he has left to the second student. Given that he is left with 43 pieces of candy after giving his candy to the two students, find the value of x.

_____ **4.** Evaluate $(1+5) \times [(5 \times 3) - 2^2] - 3^2 \times 2$.

_____ **5.** Brighten has a fair coin that he flips five times. What is the probability that he gets five heads in a row?

_____ **6.** Find the 21st prime number.

_____ **7.** What is the volume of a sphere that has a surface area of 36π square units?

_____ **8.** What is the value of x that satisfies $\sqrt{x + \sqrt{x + \sqrt{x + \ldots}}} = 4$?

_____ **9.** What is the integer value of x such that $\{29, 420, x\}$ is a Pythagorean Triple?

_____ **10.** Evaluate $\frac{1}{7} + \frac{2}{49} + \frac{3}{343} + \ldots$.

_____ **11.** What is the 7th hexagonal number?

_____ **12.** What is the sum of the interior angles of a $29-$gon in degrees?

_____ **13.** Compute the hundreds digit of $10!$.

_____ **14.** Bryan is looking for some treasure, and he is using a map that is in the shape of a regular hexagon with side length 8 miles. He labels the vertices A through F going clockwise. The path he has to take is a triangle with the vertices ACE. What is the length of the path he takes?

_____ **15.** Evaluate $641\frac{1}{11} \times 22$.

_____ **16.** Find the smallest positive integer with 16 distinct positive divisors.

_____ **17.** Evaluate 2021^2.

_____ **18.** Anthony is buying his first house and wants to figure out his monthly payment. His house costs $\$100,000$ and he has a $30-$year, compounded annually, 1.2% simple interest loan. Calculate his average monthly payment as a simplified improper fraction.

_____ **19.** Aaron finds a stop sign in the shape of a regular octagon with side length 4. Find the area of the sign, and leave the answer is simplest radical form.

_____ **20.** John and Anthony are fielding baseballs 375 feet apart. If Anthony runs directly at the ball at 25 feet per second and John hits the ball directly at Anthony at a speed of 100 feet per second. How many inches will Anthony run to reach the ball? Assume the baseball and Anthony travel at a constant speed.

_____ **21.** Find the number of positive divisors of 20^{21}.

_____ **22.** Find the units digit of $1^{337} + 13^{37} + 133^7$.

_____ **23.** There is one monkey in a tree on Friday. At noon on every subsequent day, a group of $2n$ monkeys join the tree, where n is the number of monkeys on the tree at the start of that day. If the tree collapses when more than 2021 monkeys are in the tree, on what day does the tree collapse?

_____ **24.** Yang Yang is teaching his dog how to do flips. On the nth day of the week, he spends n hours teaching his dog how to do flips (so on the first day of the week he spends one hour, on the second day he spends two hours and so on). Over the course of 420 days, how many hours in total does he spend teaching his dog how to do flips?

_____ **25.** A circle with radius r and a unit square sharing a center intersect each other 8 times. Given that these 8 intersections form a regular octagon, find r^2.