For each of the following, determine whether the sentence is

- a logical statement (or “proposition”) (write “LS”)
- a propositional function (write “PF”)
- neither (write “N”)

1. The integer 38 is even.
2. The integer -21 is even.
3. Is the integer $3^{18} - 3$ even?
4. It is not possible for $3^{18} - 3$ to be both even and odd.
5. The sum of $x$ and $y$ is 3.
6. The product of 4 and 5 is 16.
7. If the product of 4 and 5 is 20.
8. The lines $x = 0$ and $x = y$ intersect in one point.
9. Any two lines in the plane intersect in one point.
10. For any integer $n$, either $n = 0$ or $n^2 > 0$.
11. If the integer $n$ is odd, is $n^2$ odd?
12. The number $x$ must be either even or odd.
13. The product of $x + 1$ and $x - 1$ is $x^2 - 1$.
14. The integer $2^{859433} - 1$ is prime.
15. For any prime number $p$, the integer $2^p - 1$ is also prime.
16. For any positive integer $n$, the integer $2^{2^n} + 1$ is a prime.
17. If $\ell_1$ and $\ell_2$ are parallel lines, then any line $m$ which intersects $\ell_1$ also intersects $\ell_2$.
18. $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$
19. $A \cap (B - C) \cap D$