Even and Odd Numbers

A. Fill in the Blanks

1. An odd number multiplied by an odd number is always _____.

2. The only prime number that is even is _____.

3. An even number can be represented algebraically as 2k, where k is an _____.

4. Subtracting an odd number from an even number always results in an _____ number.

5. The sum of two consecutive integers is always _____.

B. Match the Following;

Column A (Operation)	Column B(Result)
1. Even + Even	A. odd
2. Odd + Odd	B. Even
3. Even + Odd	
4. Even x Any Integer	
5. Odd x Odd	

C. Practice Problems

1. 37 + 101 = _____ (Even/Odd)

2. 504 + 113 = _____ (Even/Odd)

3. 15 x 7 = _____ (Even/Odd)

4. 32 x 18 = _____ (Even/Odd)

5. 100 - 45 = _____ (Even/Odd)

D. Warm-up Questions

1. Is the number 1,578 Even or Odd?

2. Is the number 99,999 Even or Odd?

3. What is the next even number after 234?

4. What is the previous odd number before 1,001?

5. Is the result of 10 + 12 Even or Odd?

E. Challenge Questions

1. If x is an odd integer, is the expression $x^2 + 2$ even or odd? Explain your reasoning.
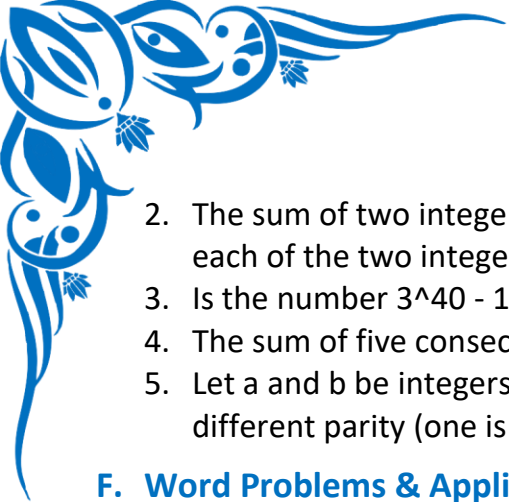
2. The sum of two integers is 31, and their product is 240. What is the parity (even or odd) of each of the two integers?
3. Is the number $3^{40} - 1$ even or odd? Explain how you know without calculating the value.
4. The sum of five consecutive integers is 155. Is the middle integer even or odd?
5. Let a and b be integers. Prove that the product (a - b)(a + b) is odd only if both a and b have different parity (one is even, one is odd).

F. Word Problems & Application

1. Maria is arranging chairs for a school assembly. She arranges 15 rows, and each row has 15 chairs. Is the total number of chairs even or odd?

2. A bakery sells muffins for $3 each (an odd price). If you buy 7 muffins, will your total cost be an even or an odd number of dollars?

3. The jersey numbers for the starting players on a basketball team are 5, 8, 11, 22, and 31. Is the sum of their jersey numbers even or odd?

4. David's house number is an even number. His next-door neighbor's house number is the next consecutive odd number, which is 45. What is David's house number?

5. A teacher has a bag of 184 marbles. Can she divide the marbles equally into two groups without any leftovers? What does this tell you about the number 184?

G. True or False

1. The sum of any two odd numbers is always odd.   _____

2. Zero is considered an even number.   _____

3. The product of any three integers is odd.   _____

4. If a number is divisible by 10, it must be even.   _____

5. An odd number raised to any positive integer power is always odd.   _____