Give 10 homework exercises on loops - using for, while, break, continue, nested loops etc. - You can use topiics from mathematics like additions, multiiplication, division, power, subtraction, decimals, fractions etc.

Absolutely! Here are 10 homework exercises on loops in Python, incorporating mathematical concepts:

1. Sum of Even Numbers:

- Write a Python program that uses a `for` loop to calculate the sum of all even numbers between 1 and 100 (inclusive).

2. Multiplication Table:

- Use nested `for` loops to print the multiplication table from 1 to 10. The output should be formatted neatly.

3. Factorial Calculation:

- Write a `while` loop to calculate the factorial of a given number (e.g., 5! = 5 * 4 * 3 * 2 * 1).

4. Prime Number Check:

- Write a program that uses a `for` loop to determine whether a given number is prime. Use a `break` statement to exit the loop early if a divisor is found.

5. Sum of Digits:

- Write a `while` loop to calculate the sum of the digits of a given integer (e.g., 1234 = 1 + 2 + 3 + 4 = 10).

6. Average of Positive Numbers:

- Write a program that repeatedly takes input from the user until they enter a negative number. Use a `while` loop and calculate the average of all positive numbers entered.

7. Fibonacci Sequence:

- Write a program that uses a `for` loop to generate the first 'n' numbers of the Fibonacci sequence (e.g., 0, 1, 1, 2, 3, 5, 8...).

8. Decimal to Binary Conversion:

- Write a `while` loop to convert a decimal integer to its binary representation (e.g., 10 to 1010).

9. Fraction Simplification:

- Write a program that takes two integers representing the numerator and denominator of a fraction. Use a `while` loop and the Euclidean algorithm to find their greatest common divisor (GCD) and simplify the fraction.

10. Pattern Printing (Nested Loops and Continue):

* Write a nested loop that prints the following pattern:
```

```
1
1 3
1 3 5
1 3 5 7
```
* Use a `continue` statement to skip even numbers.