Week 2: Homework Solutions

3.

```
# Calculate the sum of the first n reciprocal squares
n = int(input("Enter number of terms: "))
reciprocal_sum = 0
i = 1
while i <= n:
    reciprocal_sum = reciprocal_sum + i**(-2)
    i = i + 1
print("The answer is", reciprocal_sum)
```

Euler showed that as n gets larger the limit is $\pi^2/6 \simeq 1.6449$.

4.

```
# To calculate all Fibonacci numbers less than 1000
previous, current = 1, 1
print(previous)
while current < 1000:
    print(current)
    previous, current = current, current + previous
```

To print the ratio of successive terms, you can replace `print(current)` with `print(current/previous)`. This ratio tends to the golden ratio, $\phi = (\sqrt{5}+1)/2$.