

Homework 1

Due Friday, October 1, 2021

Math 205

1. Get Python 3 running on your computer, or find somewhere on the web that you can use it. Type in and run the following code, which we saw in lecture:

```
sum = 0
for i in range(1,1001):
    sum += 1/(i*i)
print(sum)
```

If you prefer to use another programming language, get that running and write some code that does the same thing as the code above.

2. The infinite sums

$$\frac{1}{1 \cdot 2} + \frac{1}{2 \cdot 3} + \frac{1}{3 \cdot 4} + \cdots$$

and

$$\frac{1}{1 \cdot 2 \cdot 3} + \frac{1}{2 \cdot 3 \cdot 4} + \frac{1}{3 \cdot 4 \cdot 5} + \cdots$$

converge to familiar numbers. Write some code to obtain good approximations for them, and make a guess at what the familiar numbers are.

(What you turn in should include both the code you wrote, and the guess that you made.)

3. Can you explain *why* those sums converge to the numbers you found? Explain at whatever level of formality seems best to you.