**SIAM Knights Python Coding Workshop:**

Select a problem set to solve with your group for the first 40 minutes of the workshop. Each group will have 10 minutes at the end of the workshop to present their solutions.

**[Problem 1]** – Plotting and functions.

1. Plot the following function in Python on the interval [-10,10]:
2. Plot the following function in Python over the interval (-1,1)

What happens at the vertical asymptote ? Why do you think is causing this? How could you plot this function without a line over the vertical asymptote?

1. Write a function to compute the value of

given parameters , , and . This is the Gaussian probability density function with mean and variance . Use the following function definition:

def gauss(x, mu, sig):

1. Use the function that you defined above to graph the Gaussian probability density function over the interval (-5,5) with the following mean and variance:
   1. ,
   2. ,
   3. ,

**[Problem 2]** – Loops and Integration

1. Consider the following sum:

Use Python to calculate the sum for N=10, N=100, N=1000. Does it appear to converge?

1. Calculate the following Riemann Sum for the function

For partition points for and . Note that this is using the left-endpoints.

1. Write a function that computes the left-endpoint Riemann sum of a given function over the interval with partition points. Use the following function definition:

def leftRiemann(f, a, b, N):