InteGreat Worksheet

1. Input the equation $f(x) = 2x + 4$ into InteGreat and set the limits of integration to 0 to 10. Then, take the integral at each of the following settings.

Number of Partitions	Integration Method	Sum
2	Left Sum	
5	Left Sum	
10	Left Sum	
50	Left Sum	
50	Right Sum	
10	Right Sum	
5	Right Sum	
2	Right Sum	

2. Based on these results, does it seem like the sums are converging to a certain number as the number of partitions increases? What number are they converging to?

3. The area under a line from 0 to 10 is really just a trapezoid. Calculate the exact area under the curve using this method. Is it similar to the number you earlier wrote that the sums were converging to?

4. Now input the equation $f(x) = \sin(x)$ into InteGreat and set the limits of integration to 0 and 3.14159 (pi). In the following table, choose any three summation methods to use. Be prepared to justify your choice:

Number of Partitions	Integration Method	Sum
2		
5		
10		
50		
2		
5		
10		
50		
2		
5		
10		
50		

5. To what number are these sums converging? How do you know? Note that this number may not be an integer or even a rational number.

6. Of the summation methods you used, which one converged more quickly? Do you think that will be the case for any function? Why or why not?

7. There is no exact way to find the integral of $f(x) = x^x$. Can you think of a way to approximate the area under this curve from 0 to 1.5? Which of the sums would be most accurate in this case? Why is that?

8. Carry out your plan outlined in (7) to approximate the area under the curve from 0 to 1.5. Be sure to check you answer with at least two different summation types.