MATH 205 – Calculus I **SQ 5.1**

Name: Nathan Shalbon Date: 11/23/2020

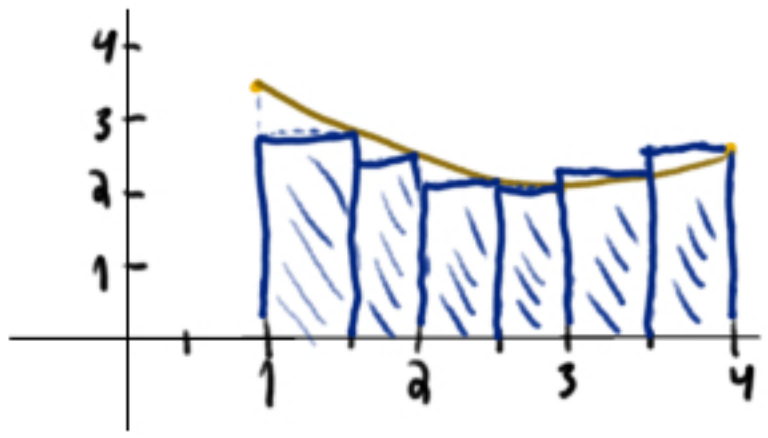
To receive any credit for the following problems, you must show complete and accurate work. Use proper limit notation and give exact answers unless otherwise noted.

1. Determine the area bounded by $g(x)=\frac{1}{3}x^2-2x+5$ and the x-axis on $[1, 4]$ by using a **Right Riemann Sum** with 6 rectangles of uniform width. Show all work including a graph of the function and the rectangles you create. Your final answer may be rounded at 3 decimal places.

$n=6$

$\Delta x=\frac{4-1}{6}=\frac{3}{6}=\frac{1}{2}$

a) On the axes below, sketch of the function and the rectangles you create.



$x_k=a+k\Delta x$

$x_k=1+\frac{k}{2}$

b) Determine and simplify the summation notation for the Right Riemann Sum to approximate the area.

$\frac{1}{2}\left(g(4)+g(3.5)+g(3)+g(2.5)+g(2)+g(1.5)\right)$

$\frac{1}{2}\left(\frac{7}{3}+\frac{25}{12}+2+\frac{25}{12}+\frac{7}{3}+\frac{11}{4}\right)=$

$\frac{1}{2}\left(\frac{28}{12}+\frac{23}{12}+\frac{24}{12}+\frac{25}{12}+\frac{28}{12}+\frac{33}{12}\right)=$

$\frac{1}{2}\left(\frac{163}{12}\right)=$

$\frac{163}{24}$

$\frac{1}{2}\sum_{k=1}^{6}\frac{1}{3}\left(1+\frac{k}{2}\right)^2-2\left(1+\frac{k}{2}\right)+5$

$6.792\approx\frac{1}{2}\sum_{k=1}^{6}\frac{1}{3}\left(1+\frac{k}{2}\right)^2-2\left(1+\frac{k}{2}\right)+5$