

Name: \_\_\_\_\_

Mark: \_\_\_\_\_

**Mini-math Div 3/4: Friday, September 23, 2022 (8 minutes)**

1. (1 point) Choose the limit of the Riemann Sum that is the integral:  $\int_2^4 \frac{1}{x+2} dx$

A.  $\lim_{n \rightarrow \infty} \sum_{k=1}^n \frac{1}{\frac{k}{n} + 2} \cdot \left(\frac{2}{n}\right)$

C.  $\lim_{n \rightarrow \infty} \sum_{k=1}^n \frac{1}{\frac{k}{n} + 4} \cdot \left(\frac{2}{n}\right)$

B.  $\lim_{n \rightarrow \infty} \sum_{k=1}^n \frac{1}{\frac{2k}{n} + 2} \cdot \left(\frac{2}{n}\right)$

D.  $\lim_{n \rightarrow \infty} \sum_{k=1}^n \frac{1}{\frac{2k}{n} + 4} \cdot \left(\frac{2}{n}\right)$

2. (1 point) Choose the integral that is the limit of the Riemann Sum:  $\lim_{n \rightarrow \infty} \sum_{k=1}^n \sin\left(1 + \frac{8k}{n}\right) \cdot \frac{4}{n}$

A.  $\int_0^4 \sin(1 + 2x) dx$     B.  $\int_1^5 \sin(1 + x) dx$     C.  $\int_1^5 \sin(1 + 2x) dx$     D.  $\int_1^5 \sin x dx$

3. (1 point) Suppose  $f$  is a concave up function and the following are selected values of  $f$ :

$x$	0	1	3	4	6
$f(x)$	3	2	4	6	12

If we use the trapezoidal rule with 4 unequal subintervals to approximate  $\int_0^6 f(x) dx$ , then:

- A.  $\int_0^6 f(x) dx \approx 31.5$  and this is an underestimate
- B.  $\int_0^6 f(x) dx \approx 31.5$  and this is an overestimate
- C.  $\int_0^6 f(x) dx \approx 63$  and this is an underestimate
- D.  $\int_0^6 f(x) dx \approx 63$  and this is an overestimate

4. (1 point) Suppose  $V(x) = \int_0^{x^2} \sin t dt$ . What is the derivative,  $V'(x)$ ?

- A.  $\cos x$
- B.  $\sin x$
- C.  $\sin x^2$
- D.  $2x \sin x^2$