

**Student:** \_\_\_\_\_  
**Date:** \_\_\_\_\_

**Instructor:** Pangyen Weng  
**Course:** Calculus II

**Assignment:** 1.3 Sigma Notation and  
 Limits of Finite Sums

1. Write the sum without sigma notation. Then evaluate the sum.

$$\sum_{k=1}^2 \frac{15k}{k+4}$$

Write the sum without sigma notation. Choose the correct answer below.

- A.  $\left(\frac{15 \cdot 1}{1+4}\right) + \left(\frac{15 \cdot 2}{2+4}\right) + \left(\frac{15 \cdot 3}{3+4}\right)$
- B.  $\frac{15k}{2+4}$
- C.  $\frac{15 \cdot 2}{2+4}$
- D.  $\left(\frac{15 \cdot 1}{1+4}\right) + \left(\frac{15 \cdot 2}{2+4}\right)$

The value of the sum is .  
 (Simplify your answer.)

2. Write the sum without sigma notation. Then evaluate.

$$\sum_{k=1}^5 \cos k\pi$$

Write out the sum.

$$\sum_{k=1}^5 \cos k\pi = \text{$$

Evaluate the sum.

$$\sum_{k=1}^5 \cos k\pi = \text{} \text{ (Simplify your answer.)}$$

3. Which of the following expresses  $1 + 2 + 4 + 8 + 16 + 32 + 64$  in sigma notation?

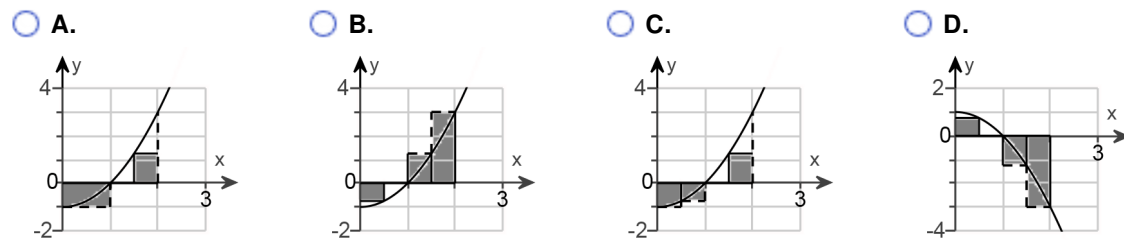
(a)  $\sum_{k=1}^7 2^{k-1}$     (b)  $\sum_{k=0}^6 2^k$     (c)  $\sum_{k=-1}^5 2^{k+1}$

Choose the correct answer below.

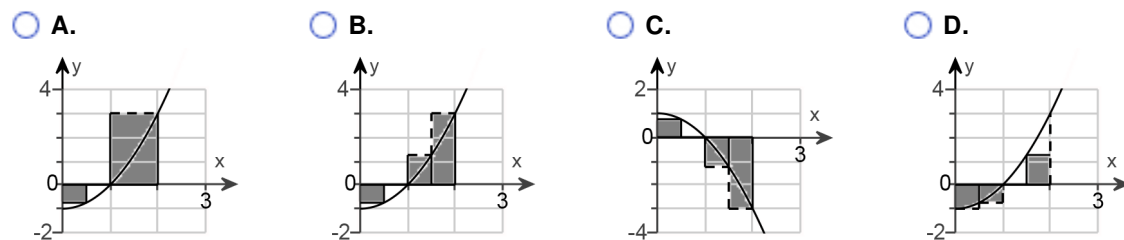
- $\sum_{k=0}^6 2^k$
- $\sum_{k=1}^7 2^{k-1}$
- All of them
- $\sum_{k=-1}^5 2^{k+1}$

4. Graph the function  $f(x) = x^2 - 1$  over the interval  $[0, 2]$ . Partition the interval into four subintervals of equal length. Then add to your sketch the rectangles associated with the Riemann sum  $\sum_{k=1}^4 f(c_k) \Delta x_k$ , given that  $c_k$  is the (a) left-hand endpoint, (b) right-hand endpoint, (c) midpoint of the  $k$ th subinterval.

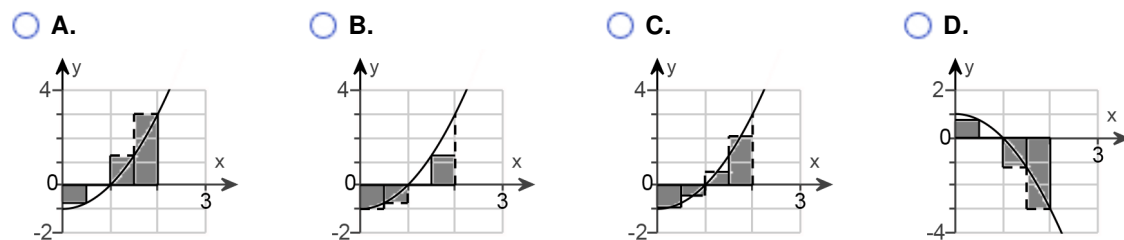
(a) Choose the correct graph below.



(b) Choose the correct graph below.



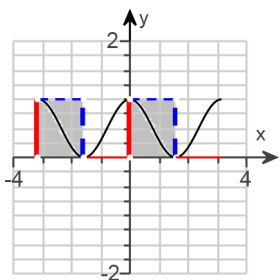
(c) Choose the correct graph below.



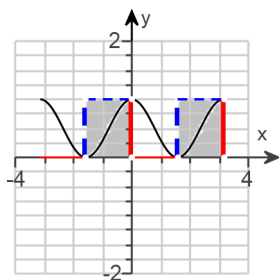
5. Graph the function  $f(x) = \cos^2 x$  on the interval  $[-\pi, \pi]$ , showing the addition of the rectangles associated with the Riemann sum  $\sum_{k=1}^4 f(c_k) \Delta x_k$  given that  $c_k$  is the left endpoint of the  $k$ th subinterval.

Choose the correct graph.

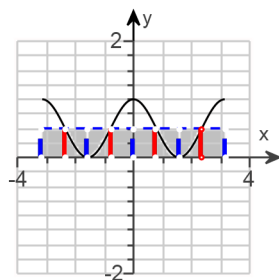
A.



B.



C.



1. D.  $\left(\frac{15 \cdot 1}{1+4}\right) + \left(\frac{15 \cdot 2}{2+4}\right)$

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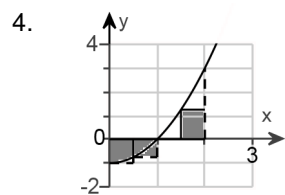
2.  $\cos(1\pi) + \cos(2\pi) + \cos(3\pi) + \cos(4\pi) + \cos(5\pi)$

- 1

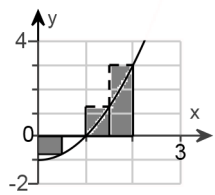
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3. All of them

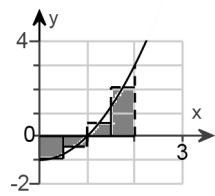
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C.

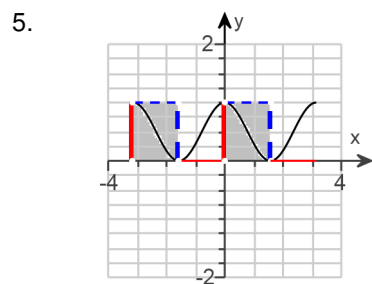


B.



C.

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A.

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