Calculus Section 4.3 Properties of Definite Integrals
-Evaluate a definite integral using properties of definite integrals

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An indefinite integral is used to find the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a function.

The definite integral is used to notate finding the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Definite Integral**If the function f is continuous on the closed interval [a, b], then the area of the region bounded by the graph of f and the x-axis is:
where a and b are the endpoints of the region whose area you are finding.

The value of a is always the left most (smallest value) of the interval. For instance, the area under the curve bounded by [3, 7] will have a = 3 and b = 7: .

The definite integral is an accumulator of area. This means that the area adds to its value as it moves from \_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_.

If the value of b is smaller than the value of a, then the area is moving \_\_\_\_\_\_\_\_\_\_\_ and will be \_\_\_\_\_\_\_\_\_\_\_.

Areas above the x-axis are considered \_\_\_\_\_\_\_\_\_\_\_\_\_ while areas under the x-axis are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This means that a negative area while moving right-to-left would be counted as \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Example)

If f(8) = 4, determine the absolute minimum value of f on the closed interval 0 ≤ x ≤ 8.

**Properties of Definite Integrals**

1. If f is defined at x = a, then
2. If f is integrable on the entire interval [a, b] and c is a value such that a < c < b, then
3.
4.
5. If f(x) is an even function, then
6. If f(x) is an odd function, then

Example) and . What is the value of ?

Example) , , and . Evaluate .