

DEPARTMENT of MATHEMATICS

MAT302-120

Instructor:

CLT:

AREA UNDER A CURVE

OBJECTIVE: To evaluate the relationship between the area under a curve and the value of the definite integral.

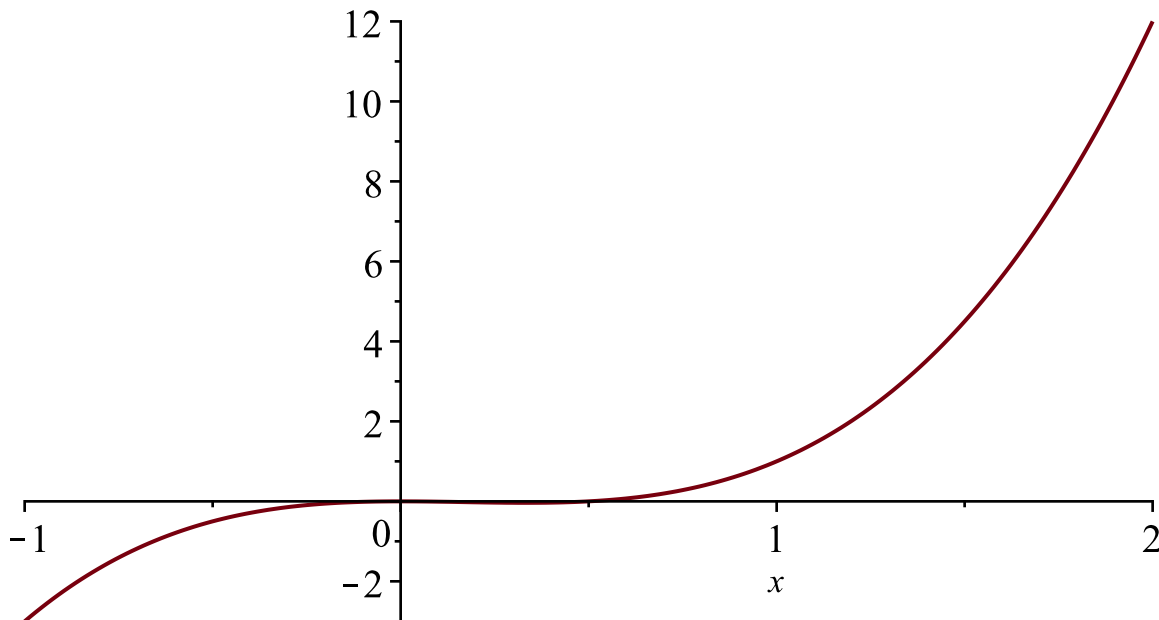
a) The function $f(x)=2x^3 - x^2$ can be plotted in a graph as shown below.

> $f := x \mapsto 2x^3 - x^2$;

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(1)

> $\text{plot}(f(x), x = -1 \dots 2,);$



b) To find the total areal covered by the graph from $x=-1$ to $x=2$, we find the summation of the areas $x = -1 \dots 0$, $x = 0 \dots 0.5$ and $x = 0.5 \dots 2$ as shown below

> $\text{area} := \text{abs}(\text{int}(f(x), x = -1 \dots 0)) + \text{abs}(\text{int}(f(x), x = 0 \dots 0.5)) + \text{int}(f(x), x = 0.5 \dots 2);$

$$\text{area} := 6.187500000$$

(2)

c) The integral of the function $f(x)=2x^3 - x^2$ can be given as;

> $\text{definiteintegral} := \text{int}(f(x), x = -1 \dots 2);$

$$\text{definiteintegral} := \frac{9}{2}$$

(3)

d) The result found in b and c above are not equal since when finding area in b, we took care of the negative value by finding its absolute value therefore making it larger than the value in c.