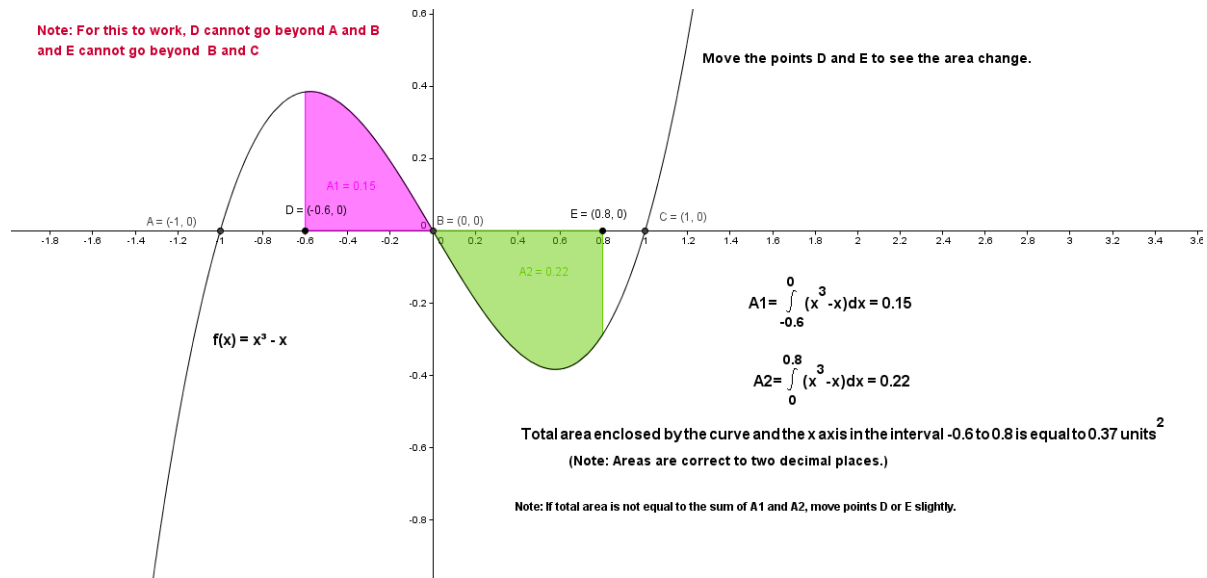


Student Activity: To investigate the relationship between integration of a function and the area enclosed by the curve representing the function and the x axis

Use in connection with the interactive file, 'Integration and Area 3', on the Student's CD.



It is recommended that in all instances students draw a sketch of the function in question.

1.

a. Calculate $\int_{-0.6}^0 (x^3 - x) dx$.

b. What is the area enclosed by the graph of the function $f(x) = x^3 - x$ and the x axis in the interval $[-0.6, 0]$?

c. Calculate $\int_0^{0.8} (x^3 - x) dx$.

- d. As area is always positive, what is the total area enclosed by the graph of the function $f(x) = x^3 - x$ and the x axis in the interval $[-0.6, 0.8]$?

- e. Why does $\int_{-0.6}^{0.8} (x^3 - x) dx$ not equal to the total area enclosed by the graph of the function $f(x) = x^3 - x$ and the x axis in the interval $[-0.6, 0.8]$?

2.

- a. Draw a rough sketch of the function $f(x) = x(x - 3)(x - 4)$.

- b. Find the area enclosed by the curve representing the function $f(x) = x(x - 3)(x - 4)$ and the x axis in the interval $[0, 4]$. Show calculations.

3. Find the area enclosed by the graph of the function $f(x) = x(x-4)$ and the x axis in the interval $[-1, 3]$.

4.

- a. In order to calculate the area enclosed by the graph of the function $f(x) = x^3 + 3x^2 - x - 3$ and the x axis in the interval $[-3, 1]$, why is it not sufficient

to calculate $\int_{-3}^1 (x^3 + 3x^2 - x - 3) dx$ to represent the total area?

- b. Calculate the area enclosed by the graph of the function $f(x) = x^3 + 3x^2 - x - 3$