

October 1

What are important words you need to pay attention to when solving a definite integral problem?

Rate
Amount
Value

Change

Approximate
using —
Equal Intervals

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Students will verbally explain how to
find the exact area under a curve using
definite integrals

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x	f(x)
-3	7
0	29
1	6
4	2
9	8

Use 4
trapezoids
to approximate
 $\int_{-3}^9 f(x) dx$

Interval	y1	y2	width	area
-3 to 0	7	29	3	54
0 to 1	29	6	1	17.5
1 to 4	6	2	3	12
4 to 9	2	8	5	25
Total Area				108.5

$$\frac{1}{2}(3(7 + 29) + 1(29 + 6) + 3(6 + 2) + 5(2 + 8)) = 108.5$$

$$A_T \approx \frac{1}{2}(w)(Y_1 + 2Y_2 + \dots + Y_n)$$

$$A_T = \frac{LRAM + RRAM}{2}$$

$$F(x) = \int \frac{x}{x^3 + 1} dx$$

If $F(0) = 2$, find $F(3)$

$F(x)$ is the antiderivative
of $\frac{x}{x^3 + 1}$

$$F'(x) = \frac{x}{x^3 + 1}$$

$$\int_0^3 \frac{x}{x^3 + 1} dx = F(x) \Big|_0^3$$

$$\frac{d}{dx}(\cdot) = \frac{x}{x^3 + 1}$$

$$\cdot = F(x)$$

$$\int_0^3 \frac{x}{x^3 + 1} dx = F(3) - F(0)$$

$$\begin{aligned} .8789 &= F(3) - 2 \\ +2 & \\ \hline 2.8789 &= F(3) \end{aligned}$$

Let $F(x)$ be an antiderivative of $\sqrt{4x^2 + 5}$. If $F(1) = 3$, find $F(5)$.

$$\int_1^5 \sqrt{4x^2 + 5} \, dx = F(5) - F(1)$$

$$28.8655 = F(5)$$