Wenesday, September 18

How is evaluating a definite integral different from finding the instantaneous rate of change?

September 18

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

(using the words:
right, left, above, below, antiderivative...)

Fundamental Theorem of Calculus

(part one)

$$\int_a^b f(x)\,dx = F(x)\Big|_a^b = F(b) - F(a)$$

where $F'(x) = f(x)$

$\int_{-1}^{1} x^{\frac{3}{5}}\,dx =$

$$\frac{d}{dx}(?) = x^{\frac{3}{5}}$$

$$? = \frac{x^{\frac{8}{5}}}{\frac{8}{5}} = x^{\frac{8}{5}} \cdot \frac{5}{8} = \frac{5x^{\frac{8}{5}}}{8}$$

$$\int_{-1}^{1} x^{\frac{3}{5}}\,dx = \frac{5}{8}x^{\frac{8}{5}}\Big|_{-1}^{1}$$

$$= \frac{5}{8}(1)^{\frac{8}{5}} - \frac{5}{8}(-1)^{\frac{8}{5}} = \frac{5}{8}\left(\sqrt[5]{1}\right)^8 - \frac{5}{8}\left(\sqrt[5]{(-1)^8}\right)$$

$$= \frac{5}{8} - \frac{5}{8} = 0$$