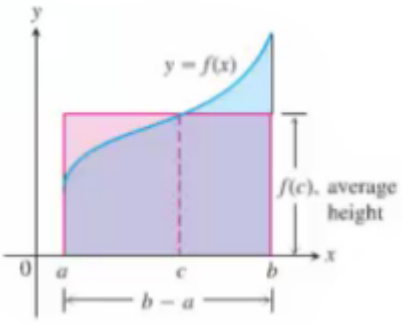
Math 141 - Calculus Name_____
Section 5.4 Video Worksheet

The Fundamental Theorem of Calculus

Mean Value Theorem for Definite Intergrals –

Fundamental Theorem of Calculus, Part 1 –

Area of rectangle $(b-a)\,f(c)=\int_a^b f(x)\,dx$



$$\int_{-3}^{4}\left(5-\frac{x}{2}\right)dx=$$

$$\int_{-\pi/3}^{-\pi/4}\left(4\sec^2 t+\frac{\pi}{t^2}\right)dx=$$

Fundamental Theorem of Calculus, Part 2 –

Extension (not in book)

$$\int_a^{v(x)} f\left(t\right)dt=F\left(x\right)$$

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$y = \int_{\sqrt{x}}^{0} \sin\left(t^2\right) dx$

$y = \int_{0}^{\sin x} \frac{dx}{\sqrt{1-t^2}}, \qquad |x| < \frac{\pi}{2}$

To find area under a curve

$y = x^{1/3} \qquad -1 \le x \le 8$

$\frac{d}{dx}\left[\int_{0}^{\sqrt{x}} \cos t dt\right]$

$\frac{d}{dt}\int_{0}^{t^4} \sqrt{u} du$