Calculus AB

4-4

(Day 3)

Second Fundamental Theorem of Calculus

The Second Fundamental Theorem of Calculus -

If f is continuous on an open interval I containing a, then for every x in the interval,

$$\frac{d}{dx}\int_{a}^{x} f(t)\,dt = f(x)$$

What does this mean?

Find F as a function of x and evaluate it at $x = 2$, $x = 5$, and $x = 8$. (pg 294)

68) $F(x) = \int_{2}^{x} (t^3 + 2t - 2)\,dt$

(a) Integrate to find F as a function of x and (b) demonstrate the Second Fundamental Theorem of Calculus by differentiating the result in part (a).

76) $F(x) = \int_{0}^{x} t(t^2 + 1)\,dt$

Use the Second Fundamental Theorem of Calculus to find $F'(x)$.

82) $F(x) = \int_{1}^{x} \frac{t^2}{t^2 + 1}\, dt$

Find $F'(x)$.

90) $F(x) = \int_{2}^{x^2} \frac{1}{t^3}\, dt$

Assignment:
Pg. 294
67-91 odd