6.4 Second Fundamental Theorem of Calculus

Name: Date:

P 5. Write an expression for the function, $f(x)$, with the given properties.

$$f'(x) = \frac{\sin x}{x} \text{ and } f(1) = 5$$

P 13. Find

$$\frac{d}{dx}\left[\int_1^x (1+t)^{200} \, dt\right]$$

P 15. Find

$$\frac{d}{dx}\left[\int_{0.5}^x \arctan(t^2) \, dt\right]$$

P 18. Use properties of the function $f(x) = xe^{-x}$ to determine the number of values x that make $F(x) = 0$, given $F(x) = \int_1^x f(t)\, dt$.

P 25. Let $F(x) = \int_0^x \sin(2t)\, dt$.

(a) Evaluate $F(\pi)$

(b) Draw a sketch to explain geometrically why the answer to part (a) is correct.

P 29. Find the value of $F(1)$ given that $F'(x) = e^{-x^2}$ and $F(0) = 2$.

P 35. Find

$$\frac{d}{dx}\left[\int_0^{x^2} \ln(1+t^2)\, dt\right]$$