

What's your 2nd name? Key

8.7
AP Calculus AB: 2nd FTC

1. If $F(x) = \int_1^x t(t^2 - 2)^3 dt$

a. Find $F(1)$.

$$F(1) = \int_1^1 t(t^2 - 2)^3 dt = \boxed{0}$$

b. Find $F'(t)$.

$$F'(t) = \boxed{x(x^2 - 2)^3}$$

c. Find $F'(2)$.

$$F'(2) = 2(2^2 - 2)^3 = \boxed{16}$$

2. Find $F'(x)$, if $F(x) = \int_{2t^3}^{\frac{\pi}{2}} \sin(x) dx$

$$F'(x) = \boxed{-6t^2 \sin(2t^3)}$$

3. Evaluate $\frac{d}{dx} \int_t^{t^2} \sqrt{3-x} dx$

$$\boxed{[2t\sqrt{3-t^2}] - [\sqrt{3-t}]}$$

4. If $g(x) = \int_x^5 \tan(2t) dt$,

a. Find $g'(x)$

$$g'(x) = \boxed{-\tan(2x)}$$

b. Find $g'(\frac{\pi}{6})$

$$g'(\frac{\pi}{6}) = -\tan(\frac{2\pi}{6}) = -\tan(\frac{\pi}{3}) = -\frac{\sqrt{3}}{1} = \boxed{-\sqrt{3}}$$