

Name: _____ Score: _____

Teacher: _____ Date: _____

The Fundamental Theorem of Calculus – Part 1

In the following exercises, use the Fundamental Theorem of Calculus, Part 1, to find each derivative.

1. $\frac{d}{dx} \int_1^x e^{-t^2} dt$ e^{-x^2}	2. $\frac{d}{dx} \int_1^x e^{\cos t} dt$ $e^{\cos x}$
3. $\frac{d}{dx} \int_3^x \sqrt{9-y^2} dy$ $\sqrt{9-x^2}$	4. $\frac{d}{dx} \int_4^x \frac{ds}{\sqrt{16-s^2}}$ $\frac{1}{\sqrt{16-x^2}}$
5. $\frac{d}{dx} \int_0^{\sqrt{x}} t dt$ $\frac{1}{2}$	6. $\frac{d}{dx} \int_{\cos x}^1 \sqrt{1-t^2} dt$ $ \sin x \sin x$
7. $\frac{d}{dx} \int_1^{x^2} \frac{\sqrt{t}}{1+t} dt$ $2x \frac{ x }{1+x^2}$	8. $\frac{d}{dx} \int_1^{e^x} \ln(u^2) du$ $2xe^x$
9. $\frac{d}{dx} \int_x^{2x} t dt$ $3x$	10. $\frac{d}{dx} \int_{\sqrt{x}}^{3x} t^2 \sin(1+t^2) dt$ $-\frac{1}{2}\sqrt{x} \sin(1+x) + 27x^2 \sin(1+9x^2)$
11. $\frac{d}{dx} \int_7^{\sin(6x)} \sqrt{t^2+4} dt$ $6 \cos(6x) \sqrt{\sin^2(6x)+4}$	12. $\frac{d}{dx} \int_{3x^2}^{-1} \frac{e^t-1}{t} dt$ $\frac{2-2e^{3x^2}}{x}$