CALCULUS

MINI EXAM 4

NAME: _____

ID: _____

SCORE: _____/ 80

RULES:
- You have 30 minutes to complete the exam.
- There are 8 questions and 80 points in total.
- You can use a non-graphing calculator.
- If you need to go to the restroom, please turn in your cellphone before.
- If you need hints, 1 hint is worth 3 points.

Evaluate the following. Use any knowledge you have gained to do. One problem may have many approaches, some shorter than others.

(1)

$$\frac{d}{dx} \int_0^{\cos x} \cos\left(t^2 - e^{-t^2}\right) dt$$

(2)

$$\frac{d}{dx} \left(\int_0^{2x} \frac{t^2}{x} dt \right)$$

(3)

$$\frac{d}{dx} \tan\left(\int_0^{\sqrt{x}} t^2 \, dt \right)$$

(4)

$$\int \sin^7(\theta^2) \cos(\theta^2)\theta \, d\theta$$

(5)
$$\int_0^\infty \sin^2 x \, dx$$

(6)
$$\int \ln x \, dx$$

(7)
$$\int e^x \cos x \, dx$$

(8)
$$\int_0^2 \frac{1}{2} \left(1 - |x - 1|\right) \, dx - \int_2^6 \sqrt{-12 + 8x - x^2} \, dx$$