

No books, notes or graphing calculators. Turn off your cell phones. Good luck!

Evaluate the following integrals:

(4) 1. $\int x^2 \sin x \, dx$

(3) 2. $\int_0^{\frac{\pi}{2}} \sin^2 x \, dx$

(3) 3. $\int \tan x \sec^2 x \, dx$

4. [1 Bonus point.] Velocity of a car satisfies the equation $v(t) = \sin(9t) \cos(8t)$ m/s. Show that after traveling for 2π seconds the car comes back to its starting point.