

MATH 1325-104 MIDTERM III

INSTRUCTOR: DAVID MILOVICH

Name: _____

- One sheet of notes (double-sided) is allowed.
- A calculator is recommended.
- Show your work.

Exercise	Point Possible	Score
1	35	
2	30	
3	35	
Total	100	

1. [35 points] Compute the following general antiderivatives.

(a) $\int (5\sqrt{x} - (7/x) + 3 + 8x) dx$

(b) $\int e^{-5x} dx$

(c) $\int xe^{-5x} dx$

2. [30 points] If the temperature T in an aquarium at time t is $T = 2t^3 - 5t + 72$ with T measured in degrees Fahrenheit and t measured in hours, then what is the average temperature over the two hours from $t = 0$ to $t = 2$?

3. [35 points] Assume the price p of imported widgets is related to quantity x supplied by the equation $p = S(x) = 100 + x/1000$; assume the price p of imported widgets is related to quantity x demanded by the equation $p = D(x) = 500 - x/1000$, where p is measured in dollars and x is measured in widgets per year.

- (a) What is the equilibrium quantity \bar{x} and equilibrium price \bar{p} ?
- (b) What is the consumer surplus of this equilibrium?
- (c) If a government quota restrict the quantity of imported widgets to 150,000 per year, then what is the resulting deadweight loss?