

Group 5 Problems: Application of antiderivatives

1. **(Tyler Brown)** For a product, the demand curve is $p=21e^{-0.021}$ and the supply curve is $p=6\sqrt{q}+9$ for $0 \leq q \leq 600$, where q is the quantity and p is the price in dollars (\$) per unit.
- What is the equilibrium point?
 - What is the consumer surplus at the equilibrium point?
 - What is the producer surplus at the equilibrium point?

5. **(Lilly Allen)** Use the fundamental theorem to solve the following

a.
$$\int_0^5 \frac{1}{(x-3)^2} dx$$

b.
$$\int_0^1 \sqrt[7]{x^6} dx$$

6. **(Clarissa McBride)** Find the total area between $y=16-x^2$ and $0 \leq x \leq 6$
7. **(Alex Flood)** Using the antiderivative find the standard area under the curve between the intervals of $t=0$ and $t=5$.
- $P=80(0.6)^t$

8. **(Harrison Walker)** The growth of a plant, $g(t)$, in mm per day is increasing. $0 \leq t \leq 12$, where t equals time in days.

Time (days)	0	2	4	6	8	10	12
Growth	32	35	37	39	42	43	44

- Estimate the total growth of the plant on the first 12 days.

- Tyler Brown
 - Adam Sheinkin
 - Brooks Wilson
 - Sam Rothwell
 - Harrison Walker
 - Stephen Glenn
 - Lilly Allen
 - Greg Manning
 - Alex Flood
 - Clarissa McBride
 - Warner Watkins
 - Jack Goodall
- * Consumer/Producer surplus
 - * Using an Antiderivatives for elasticity approximations
 - * Average Value
 - * Using an antiderivative to calculate the amount of work to move an object
 - * Reimann sum
 - * Using an antiderivative to find present and future values
 - * FTC
 - * Bounds of a given rate (upper and lower estimates)
 - * Regular Area between 2 graphs
 - * Total area between two graphs
 - * Antiderivative differentiation through substitution
 - * Total change