

<b>BEE1024 – Mathematics for Economists</b>	Juliette Stephenson Amr Algarhi
<b>Class Exercises</b>	Department of Economics
<b>Week 7</b>	University of Exeter

**There is no homework for the easter vacation; there is instead a mock exam distributed in Thursday's lecture.**

**Exercise 1** Find the indefinite integral. Check your answers by differentiating.

a)  $\int \frac{1}{x^2} dx$

b)  $\int \left( 3\sqrt{y} + \frac{2}{y^3} + \frac{1}{y} \right) dy$

c)  $\int \sqrt{t} (t^2 - 1) dt$

NB Integration by parts/by substitution questions on next tutorial sheet (after Easter)

**Exercise 2** Calculate

$$\int_2^3 \frac{1}{x^2} dx$$

**Exercise 3** Suppose the supply function in a market is  $Q^s = P^2$  and the current market price is  $P^* = 4$ . What is the producer surplus?

**Exercise 4** Calculate the area above the horizontal axis and below the graph of the function

$$y = f(x) = 16 - x^4$$

**Exercise 5** Demand is given by

$$Q^d(P) = 10 - \sqrt{P}$$

a) Find the interval of prices for which demand is positive.

b) Express total revenue  $TR = PQ$  as a function of the price. When is total revenue maximized?

c) For which price is the own-price elasticity  $ped(P) = \frac{dQ^d}{dP} \times \frac{P}{Q^d}$  equal to -1?