

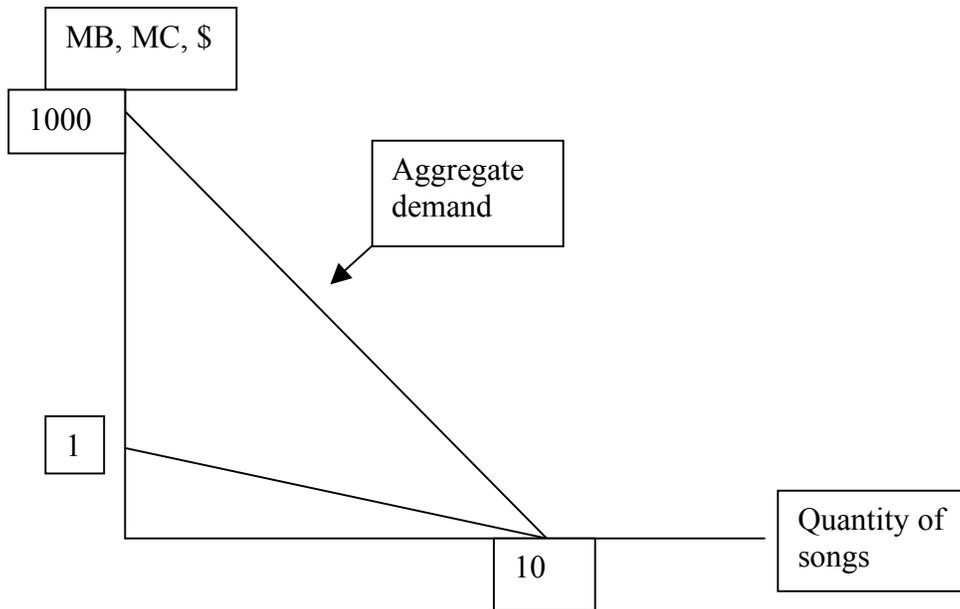
Radiohead Question © Frances Woolley, Department of Economics, Carleton University

1. Radiohead has 1000 fans. Each fan has an identical demand curve: $MB_i = 1 - 0.1Q$ where Q is the number of songs available for download and MB_i is an individual fan's marginal benefits measured in dollars. Radiohead distributes its songs on-line. Radiohead pays fixed costs of \$1000 to maintain their website, however once the website is up, the marginal cost (MC) of making additional songs available for download is zero. Once a song is on the website, it costs Radiohead nothing when people download the song. This means Radiohead's songs are non-rival.
 - a. Calculate the aggregate demand for Radiohead songs. What is the efficient number of songs to make available for download? What is the efficient price to charge? What will the total number of downloads be? Illustrate your answer with a diagram. Hint: use the condition $\sum MB_i = MC$.
 - b. At the efficient quantity in part (a), calculate total consumers' surplus, each individual person's consumer's surplus, and Radiohead's profit or loss.
 - c. Radiohead has decided to allow consumers to download their songs at any price they wish to pay – people can pay \$1, \$5, \$20 or nothing at all. Using concepts from this course compare Radiohead's pricing strategy to i-tunes' strategy of charging \$1 per download. What are the advantages and disadvantages of each pricing scheme? Your answer should be in paragraph form, and use diagrams whenever possible.

Sample solution/answer key.

- a. Calculate the aggregate demand for Radiohead songs. What is the efficient number of songs to make available for download? What is the efficient price to charge? What will the total number of downloads be? Illustrate your answer with a diagram.

Aggregate demand is $1000 \cdot MB$ or $1000 - 100Q$. $MC = 0$ so efficiency requires $1000 - 100Q = 0$ or $Q = 10$. The efficient number of songs to make available for download is 10, the efficient price to charge is zero. A bare bone diagram is below: also label efficient quantity, identify CS and PS.



- b. At the efficient quantity in part (a), calculate total consumers' surplus, each individual person's consumer's surplus, and Radiohead's profit or loss. Total consumers' surplus is the area under the aggregate demand curve or $\frac{1}{2} * 1000 * 10$ or \$5,000. Individual consumer surplus is $\frac{1}{2} * 1 * 10$ or \$5. Radiohead loses \$1000 at the efficient quantity (price=0 so revenues=0; fixed costs=1000). Note: it was important to be consistent between your answers in part (a) and your answers in part (b), so if you said the efficient quantity was 10, then you couldn't say a price other than zero etc. Parts (a) and (b) were marked together. The diagram was worth about 5 marks, and then about 2.5 marks for each of: calculation of AD, calculation of efficient quantity, calculation of efficient price, calculation of individual CS, calculation of overall CS, and calculation of profit/loss. For full marks, it was necessary to show your work clearly, label your answers (so Q=10 isn't enough, a full answer is 'the efficient quantity, Q=10) and label your diagram.
- c. Radiohead has decided to allow consumers to download their songs at any price they wish to pay – people can pay \$1, \$5, \$20 or nothing at all. Using concepts from this course compare Radiohead's pricing strategy to i-tunes' strategy of charging \$1 per download. What are the advantages and disadvantages of each pricing scheme? Your answer should be in paragraph form, and use diagrams whenever possible.

Rubric: 8-10. Answer is in paragraph form and uses diagrams. Two or three of the advantages/disadvantages below with complete explanations. Advantages of Radiohead pricing scheme: efficient quantity is achieved and consumer surplus is maximized. If consumers are willing to donate some of this consumer surplus to Radiohead, then Radiohead has a potentially viable business model. Disadvantage of i-tunes pricing scheme: at \$1 per download, the quantity demanded will be zero so i-tunes will have revenues of zero. Disadvantage of Radiohead pricing scheme: economic theory predicts that people will free-ride. Note: concepts from the course used: efficiency, consumer's surplus, free-riding, excludability (the tunes are excludable), non-rivalry (since the MC of a download is zero, downloads re non-rival).

Rubric 7-8: Similar to above, but generally with one or two of the advantages/disadvantages listed above, partial explanations, limited use of diagrams and limited use of concepts from the course.

Rubric: 6-7: Generally one of the major points above was raised. Many people asserted (wrongly) that the i-tunes model would be more profitable (but at a price of \$1, quantity demanded is zero). Limited or no use of diagrams or concepts from the course.

3-5: you wrote something down

0-2: nothing intelligible is written in the exam booklet.