

# Intro Microeconomics | Homework E

Due Monday Nov 14

Homework is designed to both test your knowledge and challenge you to apply familiar concepts in new applications. Answer clearly and completely; show your work so I can understand your thought process for partial credit; you are welcomed and encouraged to work in groups as long as your work is your own.

## Question 1 | Golden Snitches

The golden Snitch is another piece of equipment in the game of Quidditch. Since it is incredibly difficult to manufacture the Snitch to the level of uniformity required for the game, everyone in the sporting world buys their golden Snitches from one seller: Ruffelbottom's Quidditch Supply. The demand for golden Snitches is given by:

$$P = 100 - Q$$

where prices are given in terms of galleons. Ruffelbottom's marginal cost of producing each Snitch is a constant 10 galleons, and there are no fixed costs. The marginal revenue per Snitch is:

$$MR = 100 - 2Q$$

Use one graph to answer parts A through C.



**Part A. Quantity**

What is the profit maximizing number of Snitches Ruffelbottom should sell? Label on the graph above.

**Part B. Price**

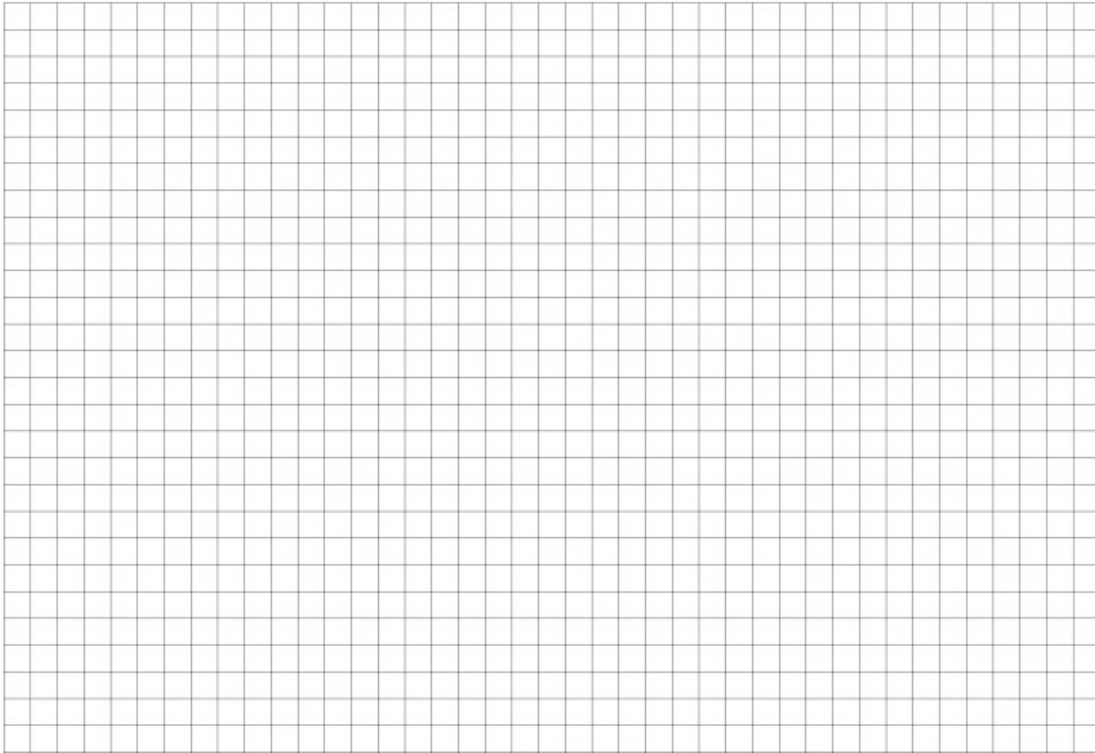
What price should Ruffelbottom charge per Snitch? Label on the graph above.

**Part C. Profit**

What is Ruffelbottom's profit from selling Snitches? Label on the graph above.

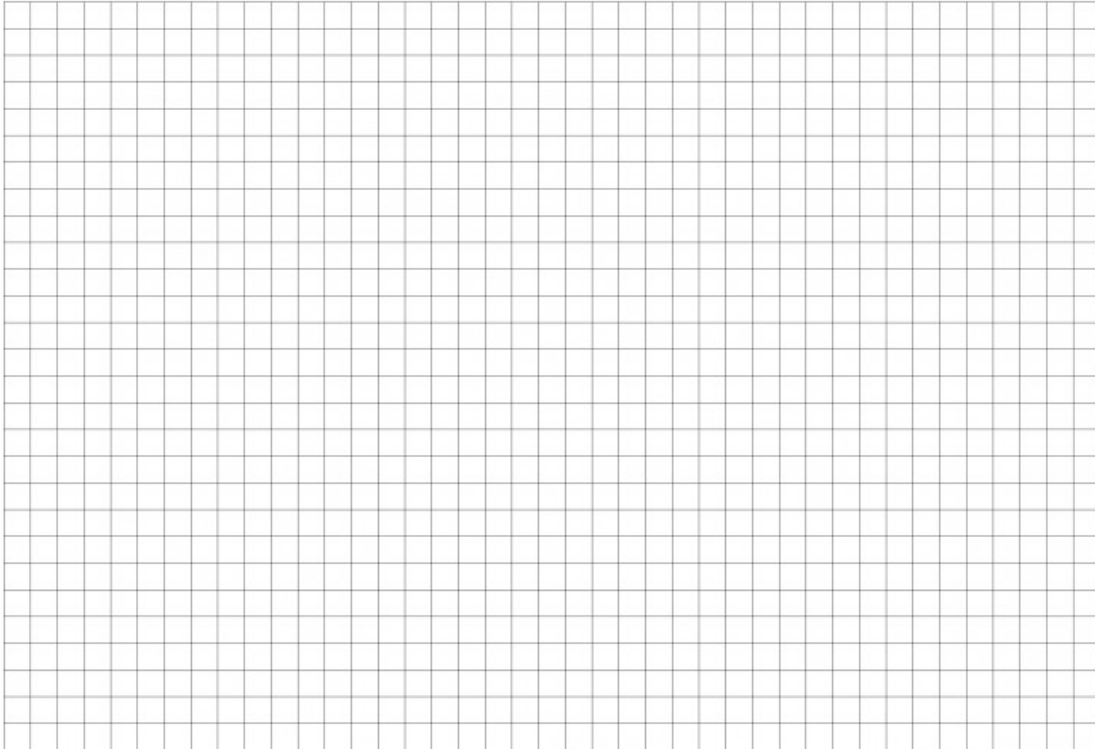
### Part D. Lumpsum Tax

The Ministry realized Ruffelbottom was capturing a great deal of welfare from the quidditch world, and decided to impose a lumpsum tax on the seller. Use a graph to show the affect this lumpsum tax had on the market.



## Question 2 | Broomsticks

Broomsticks are a branded product in the quidditch community, with each of the many broomstick makers producing broomsticks with slightly different handling and acceleration characteristics. Cleansweep Broom Company had been in the business for a long time and few, if any, new broomstick makers had opened. This all changed when the Ministry imposed a fixed annual subsidy of 100 silver pennies on each broomstick maker. Using a graph to illustrate your answer, tell the story of the broomstick market and the impact of this fixed annual fee. Be sure to finish in a long run equilibrium.



### Question 3 | Wandmaker's Dilemma

Suppose the demand for wands is given by

$$P = 200 - Q$$

and there are two main wand sellers, Olivander and Gregorovitch. Olivander can make wands at a constant marginal cost of 20, while Gregorovitch can make wands at a constant marginal cost of 30. The marginal revenue for Olivander is

$$MR_O = 200 - 2q_O - q_G$$

and for Gregorovitch it is

$$MR_G = 200 - 2q_G - q_O$$

Units are in galleons and stones. Calculate the Nash equilibrium level of output for the two wandsellers and put it in the blanks below.

***Note.** This Oligopoly is not symmetric. So the trick we used in class won't work here. Simply solve for both firm's optimization decisions separately.*

#### Part A. Olivander's Quantity

What is the Nash equilibrium quantity for Olivander?

#### Part B. Gregorovitch's Quantity

What is the Nash equilibrium quantity for Gregorovitch?

**Part C. Equilibrium Price**

What is the Nash equilibrium price in this market?

**Part D. Subsidizing Wands**

Many wizarding families had trouble affording a wand for their child when sending them to school. To make it easier for these families to send their children to wizarding school, the Ministry of Magic imposed a 10 galleon subsidy on wand sales. Model this as a 10 galleon decrease in the marginal cost of making a wand and find the Nash equilibrium quantity and price after the subsidy.