Achievement Standard 91399

Demonstrate understanding of the efficiency of market equilibrium

ECONOMICS

3.1

Externally assessed 4 credits

Allocative efficiency and market responses to change

Achievement Standard 91399 (Economics 3.1) addresses the following questions.

- How do markets achieve equilibrium?
- Why is a free market equilibrium considered to be the most efficient market outcome?
- How do changes in a market affect its efficiency?
- How does a change in a market affect its participants?
- How do changes imposed on a market by government affect the market's efficiency?

'Efficiency' in this standard always refers to 'allocative efficiency'. 'Allocative efficiency' involves seeing why a market that operates at a price and quantity that suits the wishes of both buyers and sellers gives the most efficient use of resources. When government attempts to achieve other objectives by intervening in the economy there is a loss of allocative efficiency called a 'deadweight loss'.

Given the structure of the standard, questions are likely to involve:

- graphically identifying consumer surplus, producer surplus and deadweight loss before and after changes to a market, including the market for internationally traded goods and the labour market; these changes could be either simple changes to demand and supply or government-imposed changes
- explaining the changes to consumer surplus, producer surplus, deadweight loss and government revenue that occur following changes to a market's equilibrium.

Note that to gain higher grades it will be important to be able to integrate the changes that you make on your graphs into your explanations. This could involve identifying areas on the graph or actually calculating the values of consumer surplus, producer surplus, deadweight loss or government revenue.

A market

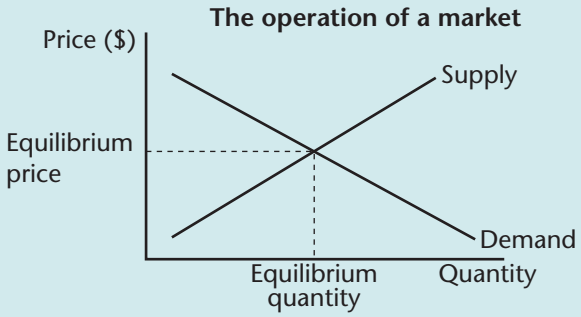
A **market** is a place or situation where buyers and sellers transact business.

The price which operates in a market acts as a rationing agent, because human wants are infinite, but the resources needed to make goods and services are limited.

Price, ruling in the market, sends signals to producers as to what is, and what is not, wanted.

With the profit motive in mind, sellers will supply more when the price is high, so more resources will be devoted to goods and services whose prices are high, and taken away from those which have low prices.

Describe and illustrate market equilibrium



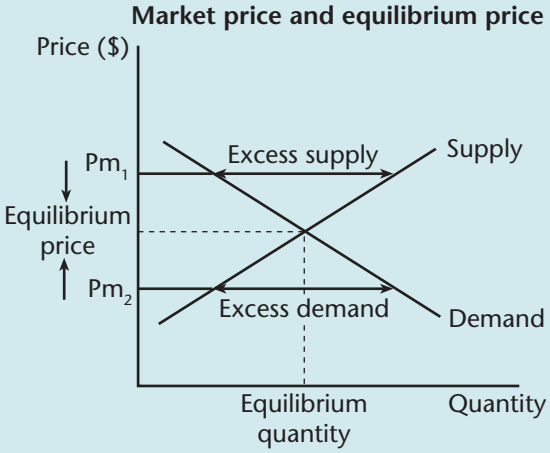
Market price and equilibrium price

Market price is the price ruling in the market – and may, or may not, be at equilibrium.

Equilibrium price is the price at which the quantity demanded exactly equals the quantity supplied – no excess supply or excess demand.

Market price will work its way towards equilibrium. Only at equilibrium are there no forces acting on market price to change.

A market price above equilibrium means excess supply, which will drive market price downwards, as producers will cut prices to get rid of excess stock, increasing the quantity demanded but reducing the quantity supplied until demand equals supply.



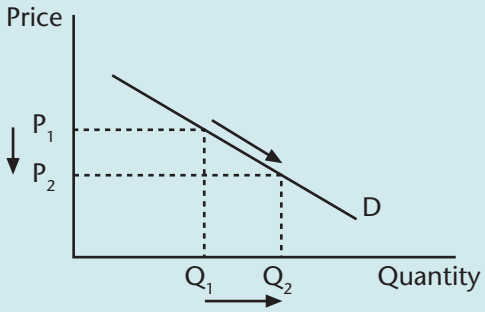
A market price below equilibrium means excess demand, which will bid market price upwards, as consumers seek to gain access to a scarce good. As the price is bid up, the amount demanded falls but producers increase the amount supplied until demand equals supply.

How a market responds to change

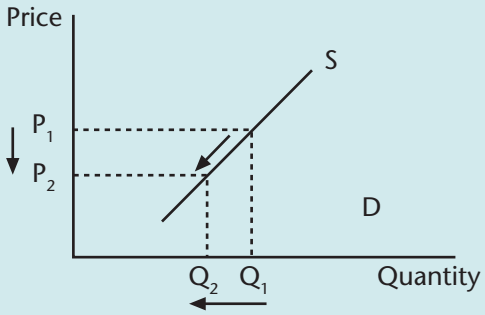
The **market demand curve** is found by summing *horizontally* all the individual demand curves to find total or market demand at each price.

The **market supply curve** is found by summing *horizontally* all the individual supply curves to find total or market supply at each price.

A change in **price** will cause a movement **along** a demand curve or a supply curve:



A change in **price** causes a movement *along* a demand curve
(i.e. a change in quantity demanded)



A change in **price** causes a movement *along* a supply curve
(i.e. a change in quantity supplied)

Questions
Allocative efficiency and market responses to change

The questions relating to this Achievement Standard require that you carefully analyse changes to each market in terms of consumer surplus, producer surplus, deadweight loss and, often, government revenue. Your answers need to be very specific. For example, if letters are used on a graph, always use them in your answer to specify each area under discussion.

Question One

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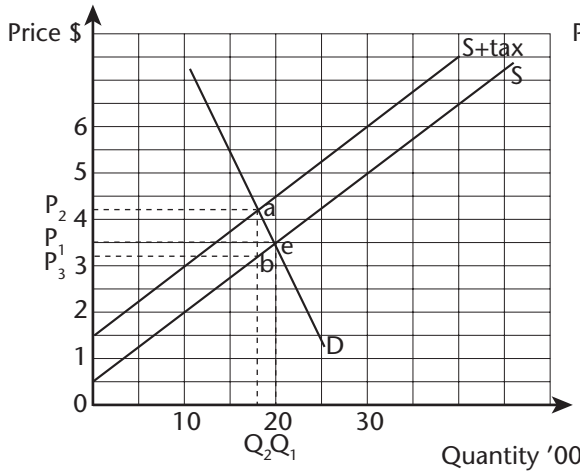
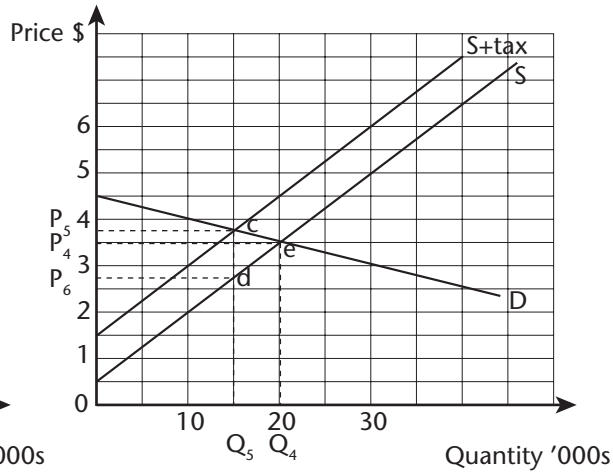
Graphs One and Two show two similarly priced products with differing price elasticities of demand.

Graph One: Inelastic demand



Graph Two: Elastic demand



Complete **1.** and **2.** below to discuss the impact of $1 tax on the efficiency in the market for goods which are price elastic, and for goods which are price inelastic.

1. In Table One below, use the labels from **Graph One** above to identify:

Table One

	Labels from Graph One
The new equilibrium price and quantity	
The change in consumer surplus	
The change in producer surplus	
The tax revenue for government	
The deadweight loss	

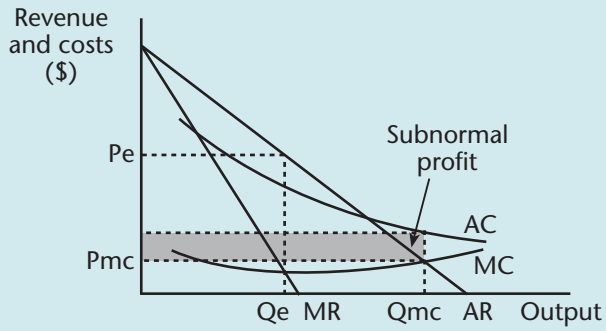
2. Compare and contrast the impact of the $1 tax on the efficiency in the market for each good. In your answer:

- explain in detail, using market forces, the change in market equilibrium for **either** good
- explain in detail, for **each** good, the changes to consumer surplus, producer surplus, and allocative efficiency
- compare and contrast the impact of the $1 tax on consumers, producers, the government, and efficiency, when the goods have different price elasticities
- refer to both graphs.

- Average cost pricing could be used, where the price is set equal to the average cost (where AR meets AC) since at this price the monopoly would be earning only normal profits. However, this price and output would not be allocatively efficient. Both marginal cost and average cost pricing appear to be preferable to the profit-maximising equilibrium since they result in lower prices and higher output than a profit-maximising monopoly would choose to operate at.

While marginal cost pricing may appear attractive since it creates allocative efficiency, problems occur with natural monopolies.

Price controls



While the price is significantly lower and output is significantly higher than that of a profit-maximising monopoly, due to the shape of the AC and MC curves, if the monopoly was forced to price at this level, it would be making a subnormal profit – AC is greater than AR at the output Qmc. In the long run this position would be unsustainable for the monopoly. It would be better off shutting down unless the government was prepared to subsidise the monopoly so that it was earning a normal profit, a proposition that the public is unlikely to accept.

Other options

Instead of price controls, other options for regulating monopolies could include:

- forcing monopolies to sell off parts of their operations that could be part of a competitive market
- forcing monopolies to allow potential competitors to access their networks or other resources that have created barriers to entry
- nationalising the monopoly – i.e. the government taking it over and running it itself. This would allow the government to operate the monopoly at the socially desirable price and quantity, thereby achieving allocative efficiency.

NCEA practice

Questions
Equilibrium of the firm

Question One

Year 2013
Ans. p. 102

In markets where there is little or no competition, the Commerce Commission may need to regulate the price and quantity of goods and services to benefit consumers.

Source: www.comcom.govt.nz/regulated-industries

The Commerce Commission has announced a reduction in wholesale price for Chorus' local copper lines. The price reduction applies to the local copper lines between homes or businesses and an exchange.

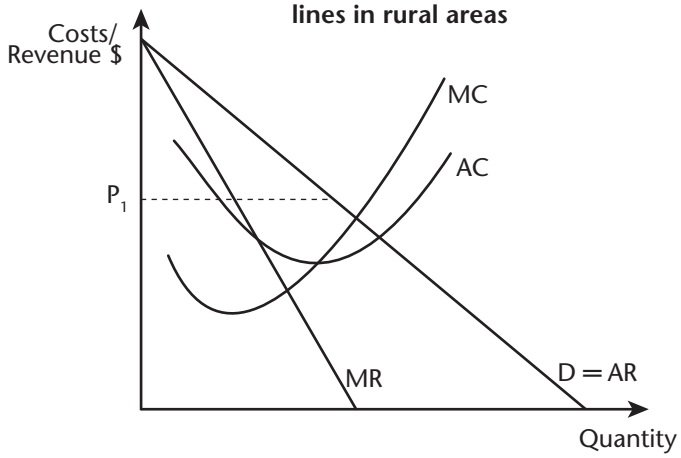
Source (adapted): Commerce Commission Media Release, 3 December 2012

Complete **1.** to **3.** below to demonstrate your understanding of the efficiency of monopolies.

1. Complete Graph One to show:

- **a.** the profit-maximising quantity ($\mathbf{Q_p}$) and price ($\mathbf{P_p}$) that the monopolist will charge
- **b.** the equilibrium price ($\mathbf{P_0}$) and quantity ($\mathbf{Q_0}$), if the market was allocatively efficient
- **c.** use letters (a, b, c, etc.) to identify the area of deadweight loss of producing at $\mathbf{Q_p}$ $\mathbf{P_p}$.

Graph One: The market for fixed phone lines in rural areas



The Commerce Commission could choose to regulate a monopoly by regulating the price to P_1.

2. Shade the area on Graph One to show deadweight loss that exists when the market for fixed phone lines in rural areas is at P_1.

3. Compare and contrast the efficiency of the market, at prices P_0, P_p, and P_1.

In your answer:

- explain why the market is allocatively efficient at P_0
- compare the allocative efficiency of the market at P_p and P_1
- explain why the Commerce Commission needs to regulate
- refer to Graph One in your explanations.

- An index begins at a base year, given the value of 100 or 1000.
- All price changes are measured from the base year.
- A weighted price index takes into account the differing importance of different goods to a typical household's budget.
- In times of inflation or deflation the purchasing power of money can alter.

Different indices are compiled for different types of goods, services and resources. The Consumer Price Index (CPI) is the official measure of inflation in New Zealand. Inflation is calculated as the percentage change in the CPI. Other main indices include The Food Price Index, Producers' Price Index, Trade-weighted Index (TWI), Farm Expenses Price Index, Labour Cost Index.

Gross domestic product (GDP)

GDP is the money value of all goods and services produced in an economy in a year. **Nominal GDP** is the year's GDP measured in *current* dollar values. **Real GDP** is the year's GDP measured in *constant* dollar values, or nominal GDP adjusted for inflation.

To calculate Real GDP:

$$\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{Price index}} \times 1\,000$$

Fluctuations in economic activity in New Zealand

Nominal GDP can rise due to either or both of two factors:

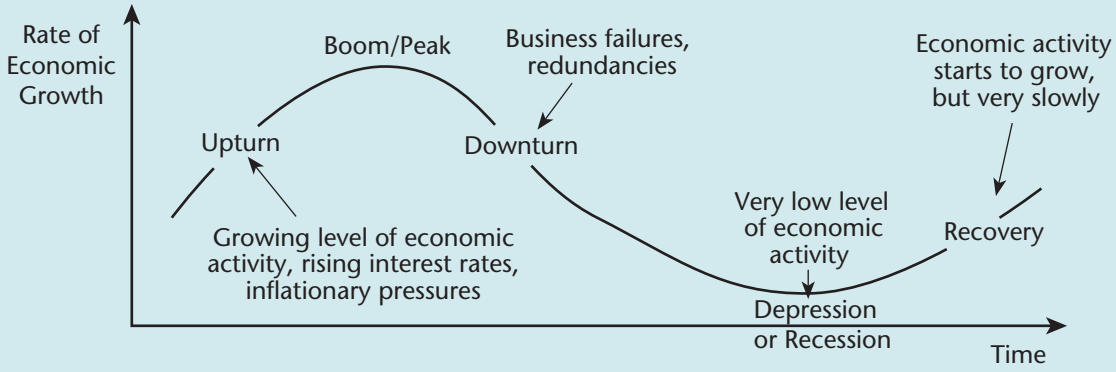
- An increase in the *general level of prices* (inflation).
- An increase in the *volume* of goods and services produced.

Real GDP attempts to measure only the volume of goods and services produced by measuring in constant dollars, so changes in Real GDP are a better measure of economic growth.

The business or trade cycle

Most economies go through periods of high growth (strong increases in real GDP) followed by periods of low or even negative growth (relatively stable real GDP). This cycle can be depicted as follows:

A typical trade cycle



NCEA practice

Questions
The circular flow model and measuring GDP

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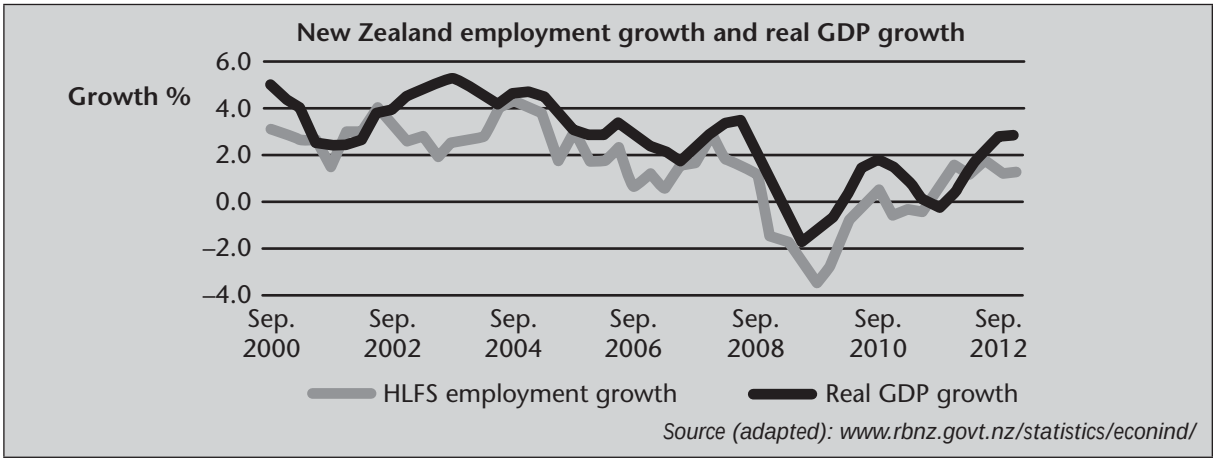
Question One



Source (adapted): www.rbnz.govt.nz/statistics/econind/

Complete **1.** to **3.** below to discuss the impacts that the business cycle and macro-economic influences have on growth and employment.

1. a. From the resource above, identify a time period when the New Zealand economy could have experienced increased consumption.

b. Explain the impact that increased consumption has on Real GDP growth and employment. Refer to the business cycle model in your answer.

2. Define what savings is, and explain the short-term impact that increased levels of savings has on Real GDP growth and employment.

Refer to the business cycle model in your answer.

The macro-economic influences of consumption, savings, and investment should not be viewed as independent, with all three having an influence on one another. The right balance between the three can help ensure sustained economic growth over the long term.

3. Compare and contrast the effectiveness of **encouraging consumption** or **encouraging savings** as a way to achieving **sustained** economic growth in the New Zealand economy.

In your answer:

- explain ONE positive and ONE negative impact of increased consumption on the macro-economy
- explain the link between savings and investment
- explain ONE positive and ONE negative impact of increased savings on the macro-economy
- explain which is more likely to lead to sustained economic growth – increased consumption, or increased savings
- refer to the business cycle model in your explanation.

quantity supplied would be Q_1. As a result, the amount of rental accommodation would actually be less than at the higher price so fewer people would be living in rental accommodation. For those consumers who could get a rental property, consumer surplus would be area $dbeP_1$, an increase from the market price of P_3. However, producer surplus would fall to area P_1ea and a deadweight loss would occur (area dce) as consumer and producer surplus are not being maximised.

The government's goal of affordable rents for more people is not achieved since the amount of rental accommodation falls from Q_2 to Q_1. (E)

Question Three

p. 11

1. The increase in building activity would result in an increase in labour used to produce building materials and therefore a decrease in labour allocated to the production of other goods.

   Note that this answer assumes full employment. In a labour market with unemployment more labour could be employed producing building materials without any impact on the production of other goods.

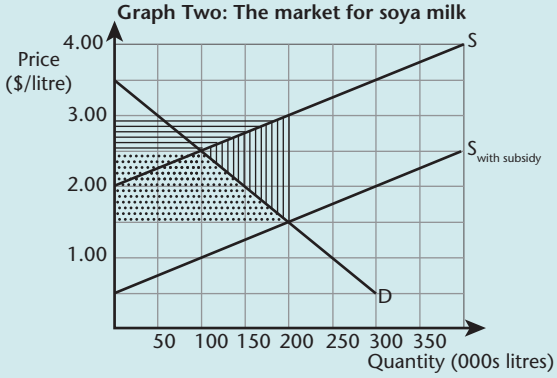
2. At point E the quantity demanded is equal to the quantity supplied so consumer and producer surpluses are maximised and the market is consequently allocatively efficient.

3. Due to the increase in demand, at the price P_e there will now be a shortage (excess demand) as the quantity supplied will be less than the quantity demanded. As a result, consumers (in this case building companies) will bid up the price of building materials. This will continue until the amount demanded equals the amount supplied at equilibrium E_1 and price P_1.

   Note that the new equilibrium is now the allocatively efficient point as it is where demand equals supply following the increase in demand.

4. Following the increase in demand consumer surplus has increased from area BEP_e to area CE_1P_1 and producer surplus has increased from area AEP_e to area P_1E_1A. Total surpluses have increased from AEB to AE_1C.

5. **Graph Two: The market for soya milk**

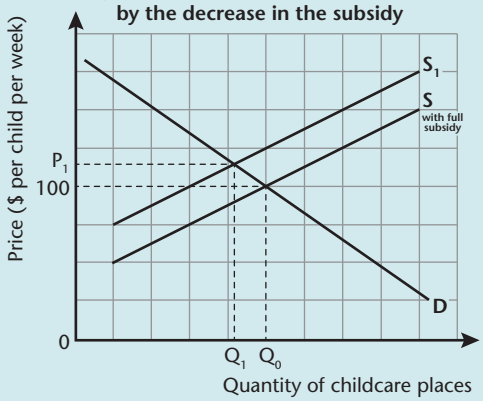


   Note the subsidy creates a deadweight loss since the total area of the subsidy does not entirely result in additional consumer or producer surplus. For the purposes of this standard it is assumed that the good concerned is a private good so any government interference in the market will result in a deadweight loss.

Question Four

p. 13

1. **Graph One: The market for full-time childcare per week in early childhood education centres affected by the decrease in the subsidy**



2. Producer surplus is the difference between the price that a producer is prepared to accept for a product and the price that they actually receive – this is the difference between the supply curve and the price. Since the supply curve is below the price for all quantities up to the equilibrium quantity, producer surplus occurs. (A)

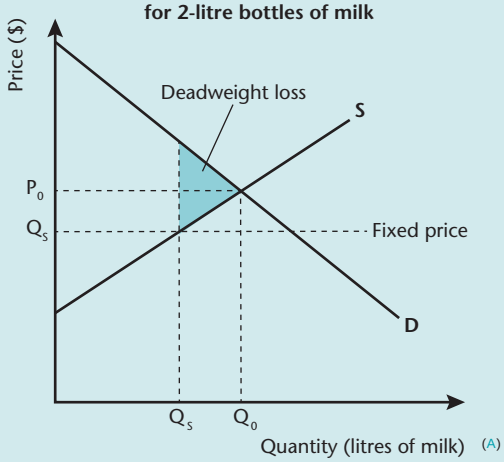
3. Following the decrease in supply, a shortage would occur at the original price of $100. This will result in consumers bidding up the price, causing quantity supplied to increase while quantity demanded would fall. This would continue so long as a shortage exists until equilibrium is reached. (A)

Question Five

p. 14

1. Allocative efficiency occurs when all resources and technology are used efficiently and the combination of goods produced is what is desired by consumers / when no one can be made better off without someone being made worse off / when all markets are in equilibrium so consumer surplus and producer surpluses are maximised. (A)

2. a. **Graph One: New Zealand domestic market for 2-litre bottles of milk**



   (A)

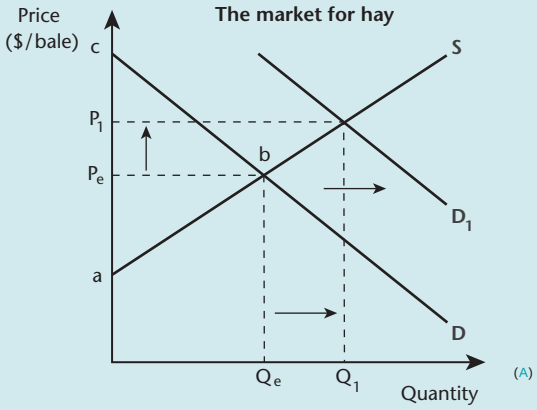
   b. A deadweight loss occurs because the fixed price is below the equilibrium price leading to a reduction in the quantity supplied to Q_S. As a result there is a loss of producer (and possibly consumer) surplus that is not gained by any other party, which is the deadweight loss. (A)

Question Six

p. 14

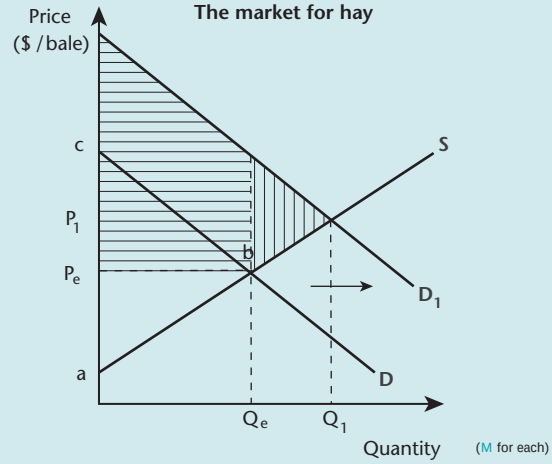
1. a. c, b, Pe (A for both a. and b.)

   b. Pe, b, a

2. 

(A)

3. At the original equilibrium price there would be a shortage in the hay market, following the increase in demand. As a result, consumers (farmers) would bid up the price in an attempt to buy the hay that they require. This would cause the quantity supplied to increase and the quantity demanded to fall. This would continue until a price is reached at which supply equals demand. (M)

4. 

(M for each)

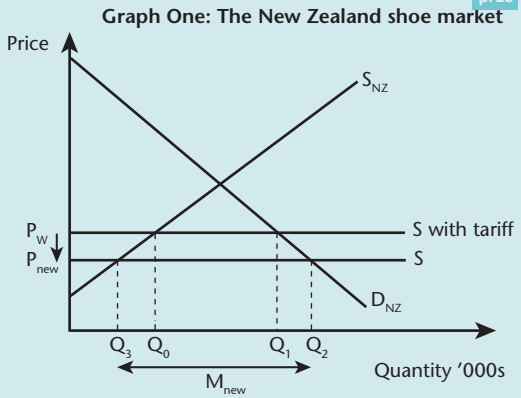
5. Deadweight loss is the loss of consumer and producer surplus that is not gained by any other party. (A)

6. The increase in demand will cause an increase in the market price, providing an incentive for firms to increase the quantity supplied. In the short run at least one factor of production is fixed, restricting the firms' ability to increase production in response to the price increase. In the long run all factors are variable, enabling the firms to fully respond to the increase in price. (M)

3.1 Internationally traded commodities

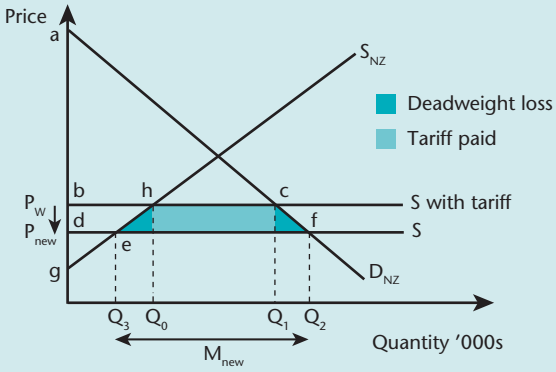
Question One

p. 18

1. a. 

b. As a result of the removal of tariffs (which are a tax on imports), imported shoes will be available in New Zealand at a lower price so 'S with tariff' falls to S. Imported shoes are now available at a lower price which results in an increase in the quantity demanded, from Q_1 to Q_2. Since the market price for shoes has fallen, New Zealand producers are not prepared to supply as many shoes to the market so the quantity supplied will decrease from Q_0 to Q_3 with imports increasing to M_{new} to make up the gap.

Hint: *This question is somewhat tricky since the more common approach is to look at the deadweight loss that occurs when a tariff is imposed. As with any compare-and-contrast question, follow the bullet points closely to guide you as you write your answer.*

2. 

When the tariff was in place, the artificially high price meant that consumer surplus was reduced and a deadweight loss occurred as shown in the graph above. Alternatively, New Zealand producers gained from higher prices and therefore from higher producer surplus. The government would receive tariff revenue from the importers as shown on the graph above.

With the tariff removed and a lower price to pay, consumer surplus will increase to area abc from adf. Producer surplus will fall from area bhg to area deg as New Zealand producers will be receiving a lower price and producing less. Government revenue from tariffs will cease since the tariffs have been removed.

Overall, allocative efficiency will increase as the areas of deadweight loss will cease to exist and while producer surplus has fallen, this is more than made up for by the increase in consumer surplus. (E)

Question Two

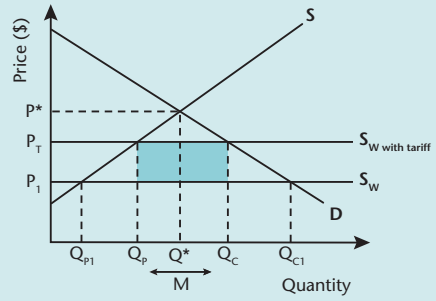
p. 20

1. a. $S_{w\ with\ tariff}$ represents the world supply of cosmetics. It is drawn as a horizontal line, as the relatively small New Zealand market can be supplied without any significant impact on the world market (having no impact on overseas producers' marginal costs), so New Zealand's demand can be met at the world price. (M)

Answers

b. and **c.**

Graph One: The New Zealand market for cosmetics



(A – for **b.** and another A for all of **c. i., ii. iii.** correct; M – **c. iv.**)

d. *Key points*:

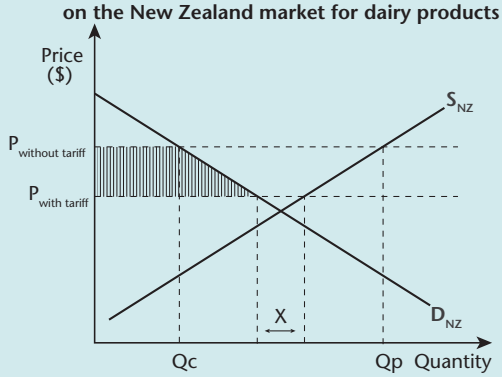
- As a result of the tariff removal, the price of cosmetics in New Zealand will fall from P_T to P_1.
- As a result of the lower price of imports, New Zealand producers are less competitive and production falls from Q_P to Q_{P1}. Producer revenue will fall. Production will fall. Producer surplus will be less.
- The lower price of cosmetics results in an increase in the quantity consumed from Q_C to Q_{C1}, with imports increasing. Consumer surplus will increase.
- Fewer labour resources will be allocated to cosmetic production, as the lower price has made cosmetics less profitable and local producers are less competitive. Resources will be shifted away from this market and into other, more profitable, markets. (E)

2. The market is now allocatively efficient following the removal of the tariff. The tariff resulted in deadweight loss, as there was a loss of consumer surplus not gained by any other party. (M)

Question Three

p. 22

The impact of a free trade agreement with China on the New Zealand market for dairy products



1. X correctly identified. (A)

2. Qp and Qc – *see graph*.
(A – both correct)

3. **a.** The removal of the tariff will result in higher prices for New Zealand consumers of dairy products and so a decrease in the quantity demanded will result. (A)

b. Change in consumer surplus = shaded area. (M)

4. **a.** There will be an increase in demand for dairy workers due to derived demand; that is, more dairy production will require additional workers in the dairy industry. (M)

b. **i.** dairy workers' wages will increase;
ii. number employed will increase.
(A – both correct)

5. Government revenue will increase due to increased company tax from New Zealand dairy exporters (that is, Fonterra), and also increased income tax paid by the extra dairy workers employed. There may also be a flow-on effect as these extra incomes are spent elsewhere in the economy, thus creating additional incomes and profits. (M)

Note that GST revenue will not increase as GST is not collected on export receipts.

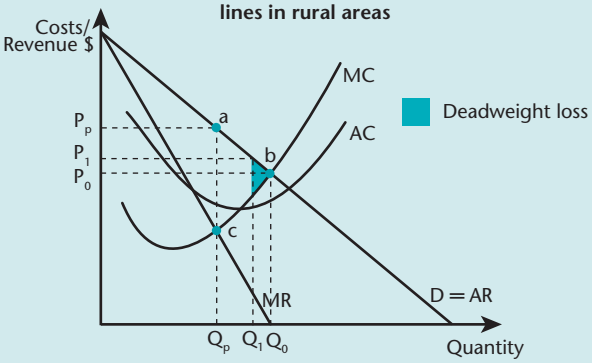
Achievement Standard 91400 (Economics 3.2): Demonstrate understanding of the efficiency of different market structures using marginal analysis

3.2 Equilibrium of the firm

Question One

p. 31

1. and **2.** **Graph One: The market for fixed phone lines in rural areas**



1. **c.** Area abc represents the area of deadweight loss of producing at P_pQ_p.

3. ***Hint:*** *When faced with questions such as this, don't be put off by the amount of space provided for the answer. Use the bullet points to address the question, writing a paragraph for each bullet point.*

The market is allocatively efficient at P_0 because this is the price that would be set if the market were operating where demand (AR) equals supply (MC). At this price, and at the corresponding quantity, the market would be in equilibrium. When markets are in equilibrium, allocative efficiency occurs as consumer and producer surplus are maximised.

At price P_p and P_1 the market is not allocatively efficient as each price corresponds to output levels that are below the allocatively efficient output, so consumer and producer surplus will not be maximised. As a result, deadweight loss will occur. Price P_1 would be less allocatively inefficient than price P_0 as the area of deadweight loss would be less and the output would be closer to the allocatively efficient output.

The Commerce Commission needs to regulate as the unregulated firm would choose to operate at the profit-maximising output and price (Q_p, P_p) resulting in allocative inefficiency and a deadweight loss. Consumer surplus is transferred to producer surplus, though the sum of producer and consumer surplus is not maximised, and the firm is able to make and maintain supernormal profits due to strong barriers to entry. In this case, the service is over-priced and under-produced and the situation will not change without regulation as competition is unable to enter the market. (E)