1. a. A case study in chapter 6 discusses the federal minimum wage law. Assume the minimum wage is set above the equilibrium wage in the market for unskilled labor. Using a supply-and-demand diagram of the market for low-wage (unskilled) labor, show the actual wage paid, the number of workers who are employed, and the number of workers who are unemployed. Also show the total wage payments to unskilled workers.

E = Employed, UE = Unemployed
The shaded area is total wage payments = Wage x (Quantity Employed)

b. Now suppose the Secretary of Labor proposes an increase in the minimum wage. What effect would this increase have on employment? Does the size of the change depend on the elasticity of demand, elasticity of supply, both elasticities, or neither? The effect would be to decrease employment. The more elastic the demand curve is, the greater will be the decline in employment.

c. What effect would this increase in the minimum wage have on unemployment? Does the size of the change in unemployment depend on the elasticity of demand, the elasticity of supply, both elasticities, or neither? The increase in the minimum wage will increase unemployment. Both supply and demand elasticities affect unemployment: the more elastic both curves are, the larger the increase in unemployment.

d. If the demand for unskilled labor were inelastic, would the proposed increase in the minimum wage raise or lower total wage payments to unskilled workers? Would your answer change if the demand for unskilled labor were elastic? If demand for unskilled labor were inelastic, then the increase in the minimum wage would increase total wage payments. If demand for unskilled labor were elastic, total wage payments would decrease.

2. The U.S. administers two programs that affect the market for cigarettes. Media campaigns and labeling requirements are aimed at making the public aware of the dangers
of cigarette smoking. At the same time, the Department of Agriculture maintains a price support program for tobacco farmers that raises the price of tobacco above the market equilibrium price.

a. How do these two programs affect cigarette consumption? Use a graph of the cigarette market to support your answer.

A price support program functions as a price floor.
The media campaign is going to decrease demand, so consumption falls.

b. What is the combined effect of these two programs on the price of cigarettes? We cannot tell the effect on the price. The decrease in demand will lower the price, while the price floor will raise price; the net effect on price is indeterminate.

c. Cigarettes are also heavily taxed. What effect does this tax have on cigarette consumption? The tax on cigarettes decreases consumption.

### 3. Price per frisbee

<table>
<thead>
<tr>
<th>Price per frisbee</th>
<th>Quantity demanded</th>
<th>Quantity Supplied</th>
</tr>
</thead>
<tbody>
<tr>
<td>$11</td>
<td>1 million</td>
<td>15 million</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>12</td>
</tr>
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<td>9</td>
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<td>3</td>
</tr>
<tr>
<td>6</td>
<td>10</td>
<td>1</td>
</tr>
</tbody>
</table>

a. What are the equilibrium price and quantity of frisbees? \( Q_d = Q_s = 6 = Q_e. \) \( P_e = $8. \)

b. Frisbee manufacturers persuade government that frisbees improve scientists' understanding of aerodynamics and thus frisbee production is important for national security. A concerned Congress votes to impose a price floor $2 above the equilibrium price. What is the new market price? What are the quantity
demanded and supplied at this price? How many frisbees are actually sold?
New price = $10; \( Q_d = 2, Q_s = 12 \). The quantity actually sold is 2.

c. Irate college students march on Washington and demand a reduction in the price of frisbees. Now, an even more concerned Congress votes to repeal the price floor and imposes a price ceiling $1 below the former price floor. What is the new price? How many frisbees are sold?
The ceiling price is greater than the equilibrium price so the ceiling is not binding.

d. After a landslide election of “affordable frisbee” candidates to Congress, the frisbee price ceiling is lowered to a more affordable level of $7. What is the new price in the market? At this price, what are the quantity demanded and the quantity supplied? What is the quantity sold?
\( Q_d = 8, Q_s = 3 \). Quantity sold is 3.

4. Lovers of classical music persuade Congress to impose a price ceiling of $40 per ticket to make classical music more affordable. Does this policy get more or fewer people to attend classical music concerts? Explain.
If the ceiling of $40 is below the equilibrium price, the quantity demanded would exceed the quantity supplied, i.e., a shortage would exist. The policy decreases the number of people who would actually attend classical music concerts, since the quantity supplied falls as a result of the below-equilibrium ceiling price.

5. Read the article by Thomas Sowell at the link for HW5 and then answer the following questions:
a. Use a supply and demand graph to show a market for hotel rooms in equilibrium at $40.

It is ok—maybe more correct—to show a very inelastic (or vertical) supply curve.
b. Now show the effects of a hurricane that destroys some homes and some hotels in the market area.

![Diagram of demand and supply curves for hotel rooms]

According to the article, a price of $109 would clear the market after the hurricane shifts the demand and supply curves for hotel rooms. Note that the analysis unambiguously shows that price will rise; however, because D shifts right while S shifts left, the effect on quantity can’t be determined.

c. If an anti-price-gouging law prevents the price of hotels from rising above $40, what situation will result?
d. What two examples does Sowell cite to show how a higher market price creates the incentives for hurricane victims to cooperate in solving the problem in a way that makes economic sense? Add a third example from your own reflection on the problem. Is there a conflict here between “economic sense” and your idea of fairness? Explain.

Sowell’s examples of the cooperation induced by higher prices:
(1) Higher prices provide incentives for families to make more intensive use of a hotel room, making room for other families. (2) Families whose homes were damaged but not destroyed would stay home and make do, leaving more hotel rooms available to those families whose homes sustained more serious damage. Another benefit of higher prices that pops into my mind: higher prices provide the wherewithal and the incentive for hotels to repair and rebuild faster.

We briefly investigate the idea of fairness in the next chapter. It seems to me that the behavioral changes listed above are consistent with most ideas of fairness. The market allocates goods and services (and the resources used to make them) to their highest valued uses. That doesn’t seem unfair to me. But clearly, fairness is an idea about which reasonable people can differ. More on efficiency vs. equity in Chapter 7.

6. Suppose the federal government requires beer drinkers to pay a $2 tax on each case of beer purchased. (In fact, both federal and state governments impose beer taxes of some sort.)

a. Draw a supply-and-demand diagram of the market for beer without the tax. Show the Price paid by consumers, the price received by producers, and the quantity of beer
P₁ is both price paid and price received. Q₁ is the quantity sold.

b. Now draw a supply-and-demand diagram for the beer market with the tax. Show the price paid by buyers, the price received by sellers, and the quantity of beer sold. What is the difference between the price paid by buyers and the price received by sellers? Did the tax cause the quantity of beer sold to increase or decrease?

P₂ is price paid by consumers; P₃ is price received by sellers. Note that P₃ = (P₂ - $2). The tax drives a $2 wedge between price paid and price received. The quantity of beer sold falls to Q₂.

c. The price elasticity of demand for beer is estimated to be about 0.8. Do buyers or sellers bear a greater burden of a tax on beer? Explain. The more inelastic side of the market bears the greater burden of a tax. If the elasticity of supply is greater than 0.8, then buyers bear a greater burden.
7. If the government places a $500 tax on luxury cars, will the price paid by consumers rise more than $500, less than $500, or exactly $500? Explain.

*Price will rise by less than $500. The only way price could rise by exactly $500 is if demand (or supply) is perfectly inelastic.*

8. The FICA tax funds Social Security programs. Congress established a 15.3% FICA tax rate; by law, the tax burden is split 50-50 between employer and employee. So, 7.65% of the employee’s earnings on each paycheck is deducted for FICA taxes, and 7.65% of the employee’s earnings is paid in FICA taxes by the employer. In the aggregate, labor demand is more elastic than labor supply. Is the economic incidence of the payroll tax shared equally by employer and employee? Explain.

*The supply of labor is very inelastic (for prime-age workers), so the payroll tax is borne almost entirely by employees (suppliers of labor services). To show this, draw a labor market with the supply curve very steep relative to the demand curve. Insert the tax wedge (of 15.3%) and note that the burden of the tax falls more heavily on the sellers (workers) in the form of lower after-tax wage received. Labor economists find that workers bear around 90% of the payroll tax.*