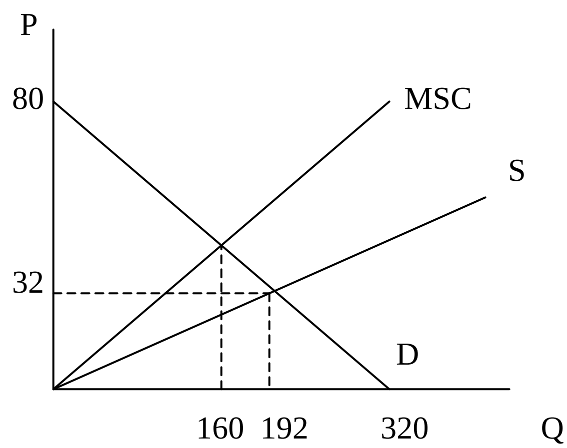
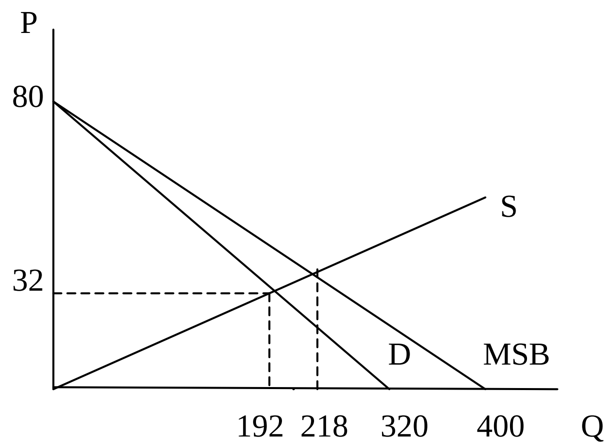
Economic 101
Practice Question #7
Answer Key

1. a.



b. In equilibrium, the quantity demanded of lift tickets, Qd, equal to its quantity supplied, Qs. Setting Qd = Qs gives 320 – 4P = 6P. Solving for P yields P = 32. Plug this back to get Q = 192.
c. No, the flow of skiers through Nepsa increases traffic and this damages the roads, costing the town money in extra road renovation. Firms supply lift tickets according to their private cost, without regard to the road damages caused to the town. Since this external effect or external cost is ignored, firms tend to undercharge and overproduce, and this leads to allocative inefficiency.
d. Note that the supply curve can be considered as the marginal private cost curve, after some algebraic manipulation:
Qs = 6*P = 6*marginal private cost, so marginal private cost = (1/6)Q.
We are given that marginal external cost = (1/12)Q.
The marginal social cost of skiers (MSC) is equal to the sum of both the marginal private cost and marginal external cost:
MSC = marginal private cost + marginal external cost = (1/6)Q + (1/12)Q = (1/4)Q.
Currently, 192 lift tickets are being sold. (This is the equilibrium quantity) Substitute this number to the marginal social cost function,
MSC = (1/4)*192 = 48.
e. Note that the inverse demand schedule can be considered as the marginal social benefit (MSB) curve. By algebraic manipulation:
Qd = 320 – 4P = 320 – 4*marginal social benefit, so MSB = 80 – (1/4)Q.
The socially efficient quantity of lift tickets can be found by setting MSB = MSC:
80 – (1/4)Q = (1/4)Q. Solving this yields Q = 160.
f. The socially efficient quantity can be attained by taxing each firm an amount equal to (1/12)*192 = $16 per lift ticket so that firms will now consider the external effect when determining their output level.

2.



b. No. Increased skier traffic brings more business to local merchants, a benefit that more than offsets costs incurred in question 1. Since this external benefit is ignored, lift tickets are overpriced and under produced, and this leads to allocative inefficiency.
c. The Nepsa Chamber of Commerce estimates the benefit to the town to be equal to (1/20)Q. So, marginal external benefit = (1/20)Q, and marginal private benefit = 80 – (1/4)Q. The marginal social benefit of skiers (MSB) is equal to the sum of both the marginal private benefit and marginal external benefit:
MSB = marginal private benefit + marginal external benefit = (1/20)Q + 80 – (1/4)Q, or MSB = 80 – (1/5)Q.
Currently, 192 lift tickets are being bought. (This is the equilibrium quantity, Q from part (a).) Substitute this number to the marginal social benefit function, MSB = 80 – (1/5)*192 = $41.60.
d. The socially efficient quantity of lift tickets can be found by setting MSB = inverse supply curve, since there are no (net) marginal external costs. Thus 80 – (1/5)Q = (1/6)Q yielding Q = 218.18, or approximately 218.
e. The socially efficient quantity can be attained by subsidizing each skier an amount equal to (1/20)*(218) = $10.90 so that skier will now consider the external effect while determining the consumption level.

3.a. At first, we need to get the market demand for lighthouses. The market Demand is the vertical summation of the two residents' demand curves. So market demand is P = 30 –(3/2)Q. Set MC = D to get optimal quantity. Then Q = 30 – 4Q. Hence we get Q = 12.
b. Plugging this optimal quantity in the market demand, P = 12.
c. If we put the optimal quantity in each person's demand function, we get each person's payment. Tracey pays $8 and Justin pays $4.
d. No, due to problems of preference revelation and free ridership.