

ECO B9502
Urban Economics
Review Sheet Selected Solutions

1. (a)

$$NPV = -50000 + \frac{12000}{(1.08)} + \frac{20000}{(1.08)^2} + \frac{12000}{(1.08)^3} + \frac{8000}{(1.08)^4} + \frac{0}{(1.08)^5} = -6335.89$$

Since $NPV < 0$ do not invest.

(b) $NPV = -313.28$. Since $NPV < 0$ do not invest.

(c) $NPV = -8082.10$. Since $NPV < 0$ do not invest.

To solve for minimum salvage value S :

$$0 = -8082.10 + \frac{S}{(1.10)^5}$$

$$S = 13016.30$$

2. (a) Set $AVC = P$

$$AVC = \frac{TVC}{V} = 20 + 6V$$

$$P = AVC$$

$$60 - V = 20 + 6V$$

$$7V = 40$$

$$V = 5.71$$

$$P = 60 - V = 60 - 5.71 = 54.29$$

(b) Easiest to solve for (b) and (c) simultaneously.

Efficient outcome where $P = MC$.

$$MC = \frac{dTVC}{dV} = 20 + 12V$$

$$P = MC$$

$$60 - V = 20 + 12V$$

$$13V = 40$$

$$V = 3.07$$

$$P = 60 - V = 60 - 3.07 = 56.92$$

$$AVC = 20 + 6V = 20 + 6(3.07) = 38.42$$

$$Toll = P - AVC = MC - AVC = 56.92 - 38.42 = 18.50$$

3. See lecture notes and text.
4. See lecture notes and text.
5. (a) No. See lecture notes and text.
(b) Second Best Pricing (aka Ramsey Pricing). See lecture notes and text.