22. Correct. The answer is false. Market price and quantity are correct, but optimal price and quantity are incorrect. Optimal social price and quantity should be Q = 3.32, and P = 1.34.

$Q_s = -5 + 8P$ =>inverse supply function $P = 0.625 + 0.125Q$

$Q_d = 6 - 2P$ => inverse demand function $P = 3 - 0.5Q$

Market price and quantity will be determined after setting the inverse supply function equal to the inverse demand function

$P = 0.625 + 0.125Q$

$P = 3 - 0.5Q$

Then solve for Q and P

$0.625 + 0.125Q = 3 - 0.5Q$

$-2.375 = -0.625Q$

$Q = 3.8$

$P = 1.1$

Socially optimal price and quantity are determined by adding the external cost of 0.30 from the inverse supply function, so that:

$P = 0.625 + 0.125Q + 0.30$

$P = 0.925 - 0.125Q$

Set demand equal to supply:

$0.925 + 0.125Q = 3 - 0.5Q$

$0.925 + 0.125Q = 3 - 0.5Q$

$Q = 3.32$

At this quantity, price must be high enough to cover private costs:

$P = 0.925 + 0.125*3.32$

$P = 1.34$