Class Drill 19: Finding the Equilibrium Price and Consumers’ and Producers’ Surplus

Suppose that
- the price demand equation is \( p = D(x) = 9 - x^2 \)
- the price-supply equation is \( p = S(x) = 3 + x \).

Draw the graphs of the two equations on the grid below. Be sure to label the graphs with their corresponding equations.

Label the coordinates of the equilibrium point using a label of the form \((\bar{x}, \bar{p}) = (\ , \ )\).

Shade the region corresponding to the consumers’ surplus and label it \( CS \).

Shade the region corresponding to the producers’ surplus (using a different shade) and label it \( PS \).
Find the consumers’ surplus. (Simplify the integrand before integrating!)

\[ CS = \int_{x=0}^{x=\bar{x}} [D(x) - \bar{p}] \, dx = \]

Find the producers’ surplus. (Simplify the integrand before integrating!)

\[ PS = \int_{x=0}^{x=\bar{x}} [\bar{p} - S(x)] \, dx = \]