

DEFINITION: The **equilibrium point** is the point where supply and demand are equal, that is, where the supply curve intersects the demand curve. Its second coordinate is the **equilibrium price**, the price at which the same quantity will be supplied as is demanded. Its first coordinate is the quantity that will be demanded and supplied at the equilibrium price; this number is called the **equilibrium quantity**.

EXAMPLE: Joseph Nolan has studied the supply and demand for aluminum siding and has determined that the price per unit, p , and the quantity demanded, q , are related by the linear equation

$$p = 60 - \frac{3}{4}q$$

The economist also concludes that the supply q of siding is related to its price p by the equation

$$p = .85q$$

What is the equilibrium quantity? What is the equilibrium price?

Solution: The equilibrium point is where the supply and demand curves intersect. To find the quantity q at which the price given by the demand equation $p = 60 - .75q$ is the same as that given by the supply equation $p = .85q$, set these two expressions for p equal to each other and solve the resulting equation:

$$60 - .75q = .85q$$

$$60 = .85q + .75q$$

$$60 = 1.6q$$

$$q = \frac{60}{1.6} = 37.5$$

Therefore, the equilibrium quantity is 37.5 units, the number of units for which supply will equal demand. Substituting $q = 37.5$ into either the demand or supply equation shows that

$$p = 60 - .75(37.5) = 31.875 \quad \text{or} \quad p = .85(37.5) = 31.875$$

to substitute into both equations, as we did here, to be sure that the same value of p results; if it does not, a mistake has been made.) In this case, the equilibrium point—the point whose coordinates are the equilibrium quantity and price — is $(37.5, 31.875)$.