The Systems

Question. Solve the following systems of equations using elimination.

1. $\begin{aligned} y &= 3x \\ y &= x + 4 \end{aligned}$

2. $\begin{aligned} -3x + y &= 2 \\ -5x + y &= -10 \end{aligned}$

3. $\begin{aligned} 2y &= 6x + 4 \\ -3x + y &= 2 \end{aligned}$

4. $\begin{aligned} \tfrac{2}{3}x + y - 15 &= 0 \\ 2x + 3y &= 7 \end{aligned}$

5. $\begin{aligned} y &= 36 - 9x \\ 3x + {}^{y}/_{3} &= 12 \end{aligned}$

6. $\begin{aligned} 7x + 2y &= 16 \\ -21x - 6y &= 24 \end{aligned}$

The Applications of the Systems

Question. The supply and demand for a printer cartridge depend on the price according to the equations

$$y_d = -10x + 500$$

where x is the price per cartridge in dollars and y_d is the demand measured in 1000s of cartridges, and

$$y_s = \frac{20}{3}x$$

where x is the price per cartridge in dollars and y_s is the supply measured in 1000s of cartridges. Find the price at which the supply and demand are in equilibrium.

Question. The supply and demand for a pack of note cards depend on the price according to the equations

$$y_d = -130x + 660$$

where x is the price per pack in dollars and y_d is the demand in 1000s of note cards, and

$$y_s = 90x$$

where x is the price per pack in dollars and y_s is the supply measured in 1000s of note cards. Find the price at which the supply and demand are in equilibrium.

Question. Given the cost function *C(x)* and the revenue function *R(x)*, find the number of units *x* that must be sold to break even.

C(x) = 20*x* + 50000
R(x) = 25*x*