

# APPLICATIONS OF LINEAR SYSTEMS

1. The cost of operating a gas-powered car is \$0.90/km. The cost of operating an electric car is \$0.30/km plus a fixed cost of \$2400. The costs can be modeled with the following equations.

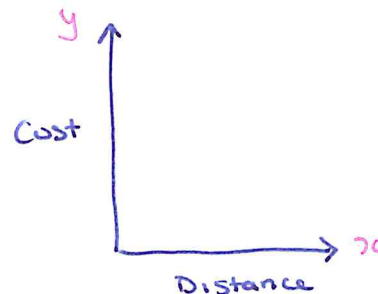
Gas Car:  $c = 0.90d$

Electric Car:  $c = 0.30d + 2400$

- a) What does each variable represent?

(y) C represents cost (\$)

(x) d represents distance in km



- b) Use substitution or elimination to solve the equations. both in  $y = mx + b$  form

①  $C = 0.90d$

②  $C = 0.30d + 2400$

$$0.90d = 0.30d + 2400$$

$$0.90d - 0.30d = 2400$$

$$\begin{array}{r} 0.60d = 2400 \\ \hline 0.60 \quad 0.60 \end{array}$$

$$\boxed{d = 4000}$$

Sub  $d = 4000$  into ①

$$C = 0.90d$$

$$C = 0.90(4000)$$

$$\boxed{C = 3600}$$

∴ POI is

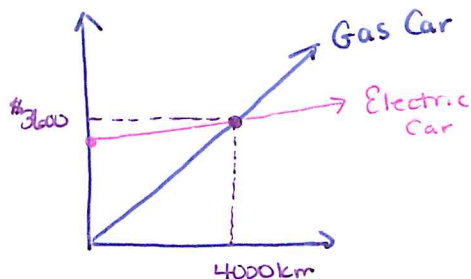
$(4000, 3600)$   
↑ km      ↑ \$

- c) What does the point of intersection represent?

POI =  $(4000, 3600)$   
↑ km      ↑ \$

∴ The POI represents that at 4000 km, both cars will cost the same (\$3600)

- d) Which type of car is more economical for driving 3000 km?



If driving 3000 km, the GAS CAR is more economical