Ex : Spotting a police car, you brake your Porsche from **25 m/s** to **10 m/s** over a distance of **90 m**.

a). What is your acceleration (assumed constant)?

$$a = \frac{v^2 - v_o^2}{2(x - x_o)} = \frac{(10 \text{ m/s})^2 - (25 \text{ m/s})^2}{2(90 \text{ m})} = -2.9 \text{ m/s}^2$$

b). How long does this take?

$$t = \frac{v - v_o}{a} = \frac{(10 \text{ m/s}) - (25 \text{ m/s})}{-2.9 \text{ m/s}^2} = 5.2 \text{ s}$$

c). If your acceleration is constant, how long does it take to stop?

$$t = \frac{v - v_o}{a} = \frac{0 - (25 \text{ m/s})}{-2.9 \text{ m/s}^2} = 8.6 \text{ s}$$

d). What is the distance covered?

$$x - x_o = \frac{1}{2}(v_o + v)t = \frac{1}{2}(25 \text{ m/s} + 0)8.6 \text{ s} = 107.5 \text{ m}$$