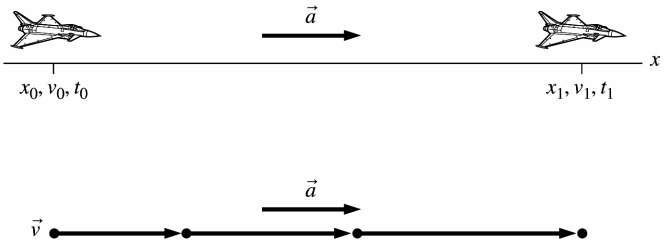
2.12. Model: Represent the jet plane as a particle.
Visualize:

Known
$x_0 = 0$ $v_0 = 300$ m/s
$t_0 = 0$ $x_1 = 4.0$ km
$v_1 = 400$ m/s

Find
a

Pictorial representation



Solve: **(a)** Since we don't know the time of acceleration, we will use

$$v_1^2 = v_0^2 + 2a(x_1 - x_0)$$

$$\Rightarrow a = \frac{v_1^2 - v_0^2}{2x_1} = \frac{(400 \text{ m/s})^2 - (300 \text{ m/s})^2}{2(4000 \text{ m})} = 8.75 \text{ m/s}^2$$

(b) The acceleration of the jet is approximately equal to g, the acceleration due to gravity.