

# HW: 3.2 Kinematics

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Drawing:

Define Variables:

$v_i$  = initial velocity  
(0 m/s)

$v_f$  = final velocity  
(28.6 m/s)

$a$  = acceleration  
?

$d$  = distance  
(54.8 m)

Identify equations to be used:

$$v_f^2 = v_i^2 + 2ad$$

Write in words how you are going to solve the problem:

I am going to assume constant acceleration / average acceleration of this car therefore I will use one of the constant acceleration equations and solve for  $a$ . (the acceleration)

Symbolic Solution:

$$v_f^2 = v_i^2 + 2ad$$

$$v_f^2 - v_i^2 = 2ad$$

$$\frac{(v_f^2 - v_i^2)}{2} = ad$$

$$\boxed{\frac{(v_f^2 - v_i^2)}{2d} = a}$$

Check your units:  $\frac{(m/s)^2 - (m/s)^2}{m} = \frac{m^2/s^2}{m} = m/s^2$

Answer:

$$7.416 \text{ m/s}^2$$