

Physics
Accelerated Motion Problem Set

Name _____
Date ___/___/___ Block _____

$$\Delta x = \frac{1}{2}at^2 + v_i t$$

$$v_f = at + v_i$$

$$v_f^2 = v_i^2 + 2a\Delta x$$

$$\Delta x = \frac{1}{2}t(v_i + v_f)$$

$$v_x = \Delta x / t$$

$$\Delta x_y = \frac{1}{2}at^2 + v_{iy}t$$

$$v_{fy} = at + v_{iy}$$

$$v_{fy}^2 = v_{iy}^2 + 2a\Delta x_y$$

1. A car starts from rest and travels for 5.0 s with a constant acceleration of -1.5 m/s^2 . What is the final velocity of the car? How far does the car travel in this time interval?
2. A driver in a car at 15.0 m/s applies the breaks, causing a uniform acceleration of -2.0 m/s^2 . How long does it take the car to accelerate to a final speed of 10.0 m/s? How far has the car moved during the breaking period?
3. A car enters the freeway with a speed of 6.4 m/s and accelerates uniformly for 3.2 km in 3.5 min. How fast (in m/s) is the car moving after this time? (HINT: Change the units first)

4. A marble dropped from a bridge strikes the water in 5 s. Calculate (a) the speed with which it strikes and (b) the height of the bridge.

(a)

(b)

5. A rock is dropped from the top of a 257.6 ft building. What is:
(a) The amount of time for it to fall?

(b) the final velocity before it hits the ground?