SPH 4U

# FINDING EQUATIONS – MORE PRACTICE

1. A CF-18 fighter jet flying at 350 m/s engages its afterburners and accelerates at a rate of 12.6 m/s2 to a velocity of 600 m/s. How far does the fighter jet travel during acceleration?
2. A butterfly accelerates over a distance of 10 cm in 3.0 s, increasing its velocity to 5.0 cm/s. What was its initial velocity?
3. During a football game, Igor is 8.0 m behind Brian and is running at 7.0 m/s when Brian catches the ball and starts to accelerate away at 2.8 m/s2 from rest.
   1. Will Igor catch Brian? If so, after how long?
   2. How far down the field will Brian have run?
4. A bullet is fired into a tree trunk, striking it with an initial velocity of 350 m/s. If the bullet penetrates the tree trunk to a depth of 8.0 cm and comes to rest, what is the acceleration of the bullet?
5. A delivery truck accelerates uniformly from rest to a velocity of 8.0 m/s in 3.0 s. It then travels at a constant speed for 6.0 s. Finally it accelerates again at a rate of 2.5 m/s2, increasing its speed for 10 s. Determine the truck’s average velocity.
6. While undergoing pilot training, a candidate is put in a rocket sled that is initially traveling at 100 km/h. When the rocket is ignited, the sled accelerates at 30 m/s2. At this rate, how long will it take the rocket sled to travel 500 m down the track?
7. A parachutist, descending at a constant speed of 17 m/s, accidentally drops his keys, which accelerate downward at 9.8 m/s2.
   1. Determine the time it takes for the keys to reach the ground if they fell 80 m.
   2. What is the final velocity of the keys just before they hit the ground?

