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For each question below:

* List the given and required variables
* Select one of the equations (explain your reasoning)
* Provide a full solution

1. A motorcycle took 6.2 seconds to accelerate to a velocity of 160 Km/h [N]. If it travelled a displacement of 220 m [N], find its acceleration.
2. A sailboat accelerates uniformly from 6.0 m/s [N] to 8.0 m/s [N] at a rate of 0.50 m/s2 [N]. What distance does the boat travel?
3. A football player initially at rest accelerates uniformly as she runs down the field, travelling 17 m [E] in 3.8 s. What is her final velocity?
4. A child on a toboggan sits at rest on the top of a tobogganing hill. If the child travels 70.0 m [downhill] in 5.3 s while accelerating uniformly, what acceleration does the child experience?
5. A helicopter travelling at a velocity of 15 m/s [W] accelerates uniformly at a rate of 7.0 m/s2 [E] for 4.0 s. What is the helicopter’s final velocity?
6. A boat increases its speed from 5.0 m/s to 7.5 m/s over a distance of 50.0 m. What is the boat’s acceleration?
7. If a car needs to increase its speed from 50 Km/h to 100 Km/h and the engine can provide a maximum acceleration of 3.8 m/s2, find the minimum length of roadway needed to reach the top speed.
8. What is the displacement of a logging truck accelerating from 10m/s [right] to 20 m/s [right]   
   in 5.0 s?
9. How far will a car travel if it starts from rest and experiences an acceleration of   
   magnitude 3.75 m/s2 [forward] for 5.65 s?
10. Determine the acceleration of a bullet starting from rest and leaving the muzzle of a   
    gun 2.75X10-3 s later with a velocity of 460 m/s [forward].
11. An aircraft starts from rest and accelerates at 42.5 m/s2 until it takes off at the end of the runway. How long will it take the aircraft to travel down the 2.6 Km runway?
12. If a cyclist travelling at 14.0 m/s skids to a stop in 5.60 s, determine the skidding distance.
13. When approaching a pedestrian crosswalk a driver of a car must slow down to a speed of 30 Km/h. If the crosswalk is 150 m away and the initial speed of the car is 50 Km/h, what must be the magnitude of the car's acceleration to reach this speed limit?
14. A dart is thrown at a target that is supported by a wooden backstop. It strikes the backstop with an initial velocity of 350 m/s [E]. The dart comes to rest in 0.0050s. (a) What is the acceleration of the dart? (b) How far does the dart penetrate into the backstop?