

### Bob's Quest for his Physics Book

Bob's parents had recently divorced and he was still trying to get used to dividing his time between both houses. It always seemed like the things he needed were at the other parent's house. His mother had a house near the water and his father had a house directly east of hers. One night he sat down to do his physics homework at his mother's house when he realized he had left his book at his dad's.

- (a) Bob hops in his car and increases his speed uniformly from 0 to 30 m/s in 6 s.
- (b) He then maintains that speed for 3 s.
- (c) Yawning, Bob decides that he's not in the mood for homework. He applies the brakes and uniformly comes to a stop in 9 s.
- (d) It takes him 2 s to turn around.
- (e) Heading back home now he reaches a speed of 20 m/s in 4 s.
- (f) He maintains that speed for 6 s while he searches for a good radio station.
- (g) Glancing up he realizes he is going to crash into a huge truck stopped at a red light. He jams on the brakes and comes to rest in 2 s (still managing to slow down uniformly). There is no damage to the truck but Bob's car is totaled. He pulls out his cell phone and tells his mom the bad news.

How many meters had Bob driven without incident?

How far does his mom have to drive to pick him up?

Graph Bob's position vs. time and velocity vs. time on the axes provided below.



