

Some Less Structured Motion and Force Problems:

1. According to one source, a 6,500 pound Ford F-150 Lightning (electric truck) can accelerate from 0-60mph in 3.8 seconds.
 - a. How far does it travel during that feat of acceleration, in meters?
 - b. What average net force does the truck experience during this acceleration, in **pounds**?
2. Some cultures speak of a character called “Santa,” who visits every good child’s home on the eve of December 25th. One study analyzed the logistics of this trip and concluded that, after visiting each house, Santa must accelerate “from a dead stop to 650 miles per second in one thousandth of a second.” If this were true it would subject Santa to a lot of g’s. [FYI, one mile = 5,280 ft]
 - a. How many g’s would he experience during this acceleration?
 - b. The force causing Santa to accelerate would be the force of his seat in the sleigh, pushing him forward. What force would the seat exert on Santa, **in pounds**, if we assume that he weighs 250 pounds (a conservative weight estimate)?
- 3 (Challenge). The Guinness World Records lists the highest trampoline jump at 22.1 feet. What was the jumper’s velocity, in **miles per hour** just before they returned to the trampoline? *[Ignore air resistance.]*