

Module 02-Lesson 6

Motion with Constant Acceleration

Question 1: A Boeing-737 typically touches down at 250 km/h. If the plane slows down at a rate of 4.5 m/s^2 , what is the minimum runway length for which the plane can land safely?

Question 2: An X-ray tube accelerates electrons at a constant rate over a distance of 16 cm. If the final speed of the electrons is $1.2 \times 10^7 \text{ m/s}$ what is the magnitude of their acceleration?

Problem: Starting from the position-time and velocity-time relationships for motion with constant acceleration, eliminate the time variable and derive a relationship between position, velocity, and acceleration that does not explicitly depend on time.