1-9 A jet plane lands with a speed of 99 m/s and can accelerate at a maximum rate of $-5.31\ m/s^2$ as it comes to rest.

(A) From the instant the plane touches the runway, what is the minimum time before it can come to rest?

The equation → Solve symbolically!

$v = v_0 + at$

$v - v_0 = at$

$t = \frac{v - v_0}{a}$

Initial conditions ←

$v_0 = 99\ m/s$

$v = 0$ (rest)

$a = -5.31\ m/s^2$

$t = \frac{0 - 99\ m/s}{-5.31\ m/s^2}$ ← Units

$t = 18.6$ sec

(B) What is the minimum distance needed?

$v^2 = v_0^2 + 2a(\Delta x)$

$v^2 - v_0^2 = 2a\Delta x$

$\Delta x = \frac{v^2 - v_0^2}{2a}$

$\Delta x = \frac{0^2 - (99\ m/s)^2}{2(-5.31\ m/s^2)} = \frac{-9801\ m^2/s^2}{-10.62\ m/s^2}$

$\Delta x = 922.8\ m = .922\ km$

For full credit, homework must include
① CID ② Equation(s) ③ Initial conditions
④ symbolic solution ⑤ Units