Phys 2320 Spring 2023 Problem related to Workshop 10

Main topics: Hooke's law, simple harmonic motion,
molecular dynamics, potential energy, kinetic energy, friction and heat

(Knight Exercise 10.20)
As a 15,000 kg jet plane lands on an aircraft carrier, its tail hook snags a cable to slow it down. The cable is attached to a spring with spring constant 60,000 N/m. If the spring stretches 30 m to stop the plane, what was the plane's landing speed? Answer: 60 m/s

(Knight Problem 10.49)
A horizontal spring with spring constant 100 N/m is compressed 20 cm and used to launch a 2.5 kg box across a frictionless, horizontal surface. After the box travels some distance, the surface becomes rough. The coefficient of kinetic friction of the box on the surface is 0.15. Use work and energy to find how far the box slides across the rough surface before stopping. Answer: 0.54 m