Hooke’s Law Practice Problems

1. A spring is attached to a 2.0 kg cart and pulls the cart along a **frictionless** floor. What is the magnitude of the acceleration of the cart if the spring constant is 2.5 N/m and the spring stretches of 8.0 cm?
2. A 1.00 kg mass on a **horizontal** spring is 0.100 m from the spring’s **equilibrium position**. If the spring constant is 10.0 N/m, what is the **elastic force** acting on the mass?
3. The **restoring force** acting on a 0.50 kg object connected to a horizontal spring is 2.0 N. If the spring constant is 15 N/m, what is the **distortion** of the spring?
4. The **elastic force acting** on a 0.60 kg object on a horizontal spring is -1.2 N. If the **distortion** of the spring is 0.025m, what is the **spring constant** of the spring?
5. A box with a **weight** of 1.65 N will stretch a **vertical** spring -0.110 m. What is the **spring constant**?
6. A mass of 5.0 kg will stretch a **vertical** spring -3.25cm. What is the spring constant?
7. A jelly bean with a force of gravity equal to -9.3 N is hung on a vertical spring of length 2.0 m that has a spring constant of 25 N/m. What is the stretched length of the spring?
8. A 75 g object pulls **horizontally** at the end of a spring (k = 5.0N/m). If the maximum displacement of the object is 0.080m, what is the maximum force from the spring?
9. A 3.50 m tall giraffe with a mass of 700.0 kg is lowered by a crane from a 70.0 m tall building. The elastic band that is attached to the head of the giraffe has a spring constant of 882N/m. What is the minimum length of elastic band needed to lower the giraffe safely to the ground?
10. Two teams of maple leaf students pull of opposite ends of a bungee cord. Each team pulls with a force of 450N, if the bungee cord has a spring constant of 10.5N/m and an undistorted length of 15.5m, what will be the **distorted length** of the bungee cord?
11. 0.1 m/s2
12. -1.0 N
13. -0.13 m
14. 48 N/m
15. 15 N/m
16. 1500 N/m
17. 2.37 m
18. -0.40 N
19. 58.7 m
20. 58.4 m