

## F.2 Forces and Hooke's Law

Practice Worksheet — name: \_\_\_\_\_ date: \_\_\_\_\_

### FORMULAS FOR THIS TOPIC

HOOKE'S LAW (RESTORING FORCE)  $F = -kx$       NEWTON'S SECOND LAW  $F_{net} = ma$

### SECTION A — MULTIPLE CHOICE

**A1.** A spring with a constant of 50 N/m is stretched by 0.1 meters. What restoring force is exerted by the spring?

- A 5 N
- B 50 N
- C 500 N
- D 0.2 N

**A2.** Which of the following is a non-contact force?

- A Frictional force
- B Tension
- C Air resistance
- D Gravitational force

### SECTION B — SHORT ANSWER

**B1.** Explain Hooke's Law and define the terms in the formula  $F = -kx$ .

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**B2.** What is the net force acting on an object traveling at a constant velocity?

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## ANSWER KEY

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### Section A

**A1:** 5 N

**A2:** Gravitational force

### Section B

**B1:** Hooke's Law states that the extension of a spring is directly proportional to the force applied to it, within its elastic limit. In the restoring force formula  $F = -kx$ ,  $F$  is the restoring force,  $k$  is the spring constant, and  $x$  is the extension/displacement.

**B2:** The net force is zero Newtons (0 N). Constant velocity implies acceleration is zero, and by Newton's Second Law ( $F = ma$ ), net force must be zero.