

Solutions

Each answer shows the steps, then the **result**.

2.1

- $k = \frac{F}{\Delta x} = \frac{25}{0.10} = 250 \text{ N m}^{-1}$

2.2

- outward, away from the compression — back toward the natural length

2.3

- $F = k \Delta x = 400 \times 0.05 = 20 \text{ N}$

2.4

- spring P (steeper slope = larger k)

3.1 B

3.2 D

- $k = 12/0.03 = 400 \text{ N m}^{-1}$

3.3

(a)

- $F = mg = 20 \text{ N}; k = \frac{20}{0.08} = 250 \text{ N m}^{-1}$

(b)

- $F = 50 \text{ N}; \Delta x = \frac{50}{250} = 0.20 \text{ m}$