

Solutions

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

2.1

- $W = Fd = 30 \times 4.0 = 120 \text{ J}$

2.2

- zero — the normal force is perpendicular to the motion ($\theta = 90^\circ$, $\cos 90^\circ = 0$)

2.3

- $W = 50 \times 10 \times 0.80 = 400 \text{ J}$

2.4

- $\text{area} = 10 \times 3.0 = 30 \text{ J}$

3.1 C

3.2 B

3.3

(a)

- $W = 40 \times 20 \times \cos 30^\circ = 800 \times 0.87 = 696 \text{ J}$

(b)

- the sled moves horizontally, so the vertical component is perpendicular to the displacement and does no work