

Solutions

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

2.1

- $\tau = rF = 0.3 \times 20 = 6 \text{ N m}$

2.2

- Zero (the lever arm is zero)

2.3

- The perpendicular distance from the axis to the line of the force

2.4

- $\tau = rF \sin \theta = 0.4 \times 50 \times \sin 30^\circ = 10 \text{ N m}$

3.1 B

- perpendicular gives the maximum torque

3.2 A

- $\tau = 0.25 \times 8 = 2 \text{ N m}$

3.3

(a)

- $\tau = 1.5 \times 300 = 450 \text{ N m}$

(b)

- $450 = 450 \times d \Rightarrow d = 1.0 \text{ m}$ from the pivot

3.4

(a)

- $\tau = 0.8 \times 40 \times \sin 60^\circ = 27.7 \text{ N m}$

(b)

- Apply it perpendicular to the door (or farther from the hinge)