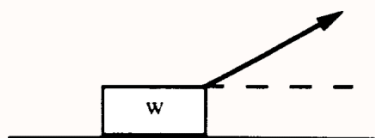


No. 1



A block of weight W is pulled along a horizontal surface at a constant speed by a force F , which acts at an angle θ with the horizontal, as shown above. The normal force exerted on the block by the surface has magnitude of

- (A) $W - F \cos(\theta)$
- (B) $W - F \sin(\theta)$
- (C) W
- (D) $W + F \sin(\theta)$
- (E) $W + F \cos(\theta)$

No. 2

Select the scalar quantity from the following list.

- (A) acceleration
- (B) displacement
- (C) force
- (D) mass
- (E) velocity

No. 3

An elevator weighing 12 000 N is accelerating upward. The tension in the cable is 20 000 N and the frictional resistance to motion is 5 000 N. The unbalanced force on the elevator is

- (A) 37 000 N (up)
- (B) 27 000 N (up)
- (C) 13 000 N (up)
- (D) 8 000 N (up)
- (E) 3 000 N (up)

No. 4

The mass of an object is a measure of its

- (A) acceleration
- (B) momentum
- (C) weight
- (D) inertia
- (E) impulse

No. 5

A paratrooper predicts that objects have less weight at high altitudes. He tests this prediction by using a spring scale calibrated in newtons to weigh a mass of one kilogram while falling from an altitude of 5000 m. ($g = 10 \text{ m/s}^2$)

What will the spring scale read during the first second of fall and before the parachute opens?

- (A) 0
- (B) 0.10 N
- (C) slightly less than 10 N
- (D) 10 N
- (E) slightly more than 10 N

No. 6

A water skier is being pulled by a boat at a constant speed v . The tension in the cable pulling the skier is T . The force exerted on the skier by the water would be

- (A) T
- (B) $T v$
- (C) $2 T$
- (D) $\frac{T}{2}$
- (E) $10 v$