

Warm Up Question 1

Stop to Think 5.2 on page 141 describes a spacecraft landing. Consider the case if the spacecraft launches vertically upwards with increasing speed. Which of the options illustrates the correct free-body diagram for this case? Explain your answer.

1. Option A. Accelerates upward. Net force upward.
2. Option A. Because the spacecraft moves upward.
3. Option D. The net force is upward.

Question 1

A phone, with mass m , is suspended in an elevator. The elevator moves up with decreasing speed. The rope suspending the phone is taut throughout the motion.



Which of the following is true regarding the tension in the rope from which the phone is suspended while it moves as described?

1. $T = mg$
2. $T > mg$
3. $T < mg$

Question 2

A phone, of mass m , is suspended in an elevator as illustrated. The elevator moves down with decreasing speed. The rope suspending the phone is taut throughout the motion.

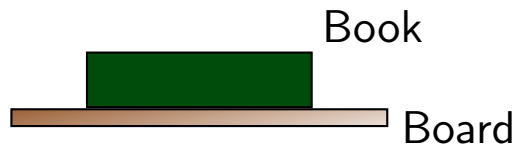


Which of the following is true regarding the tension in the rope from which the phone is suspended while it moves as described?

1. $T = mg$
2. $T > mg$
3. $T < mg$

Question 3

A book, with mass m , sits on the surface of a horizontal board. The board is held at rest.



Which of the following is true regarding the magnitude of the normal force exerted by the board on the book?

1. $n = g$
2. $n = mg$
3. $n < mg$
4. $n > mg$

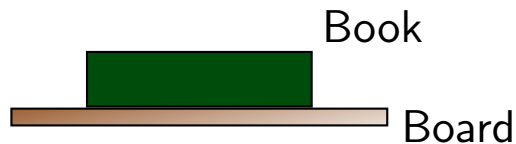
Warm Up Question 2

A book lies on a board and both move upward at a constant speed for a while. The board is then slowed to a stop and the book stays in contact with the board. During this slowing period is the normal force the same as, smaller than or larger than the gravitational force on the book? Explain your answer.

1. Normal is smaller. Acceleration is down.
2. Normal is same. Net force is zero.
3. Normal is same. Otherwise loses contact.
4. Normal is larger. Book moves up.

Question 4

A book, with mass m , sits on the surface of a horizontal board. The board accelerates upward and the book stays in contact with the board. The (magnitude of the) acceleration is a .

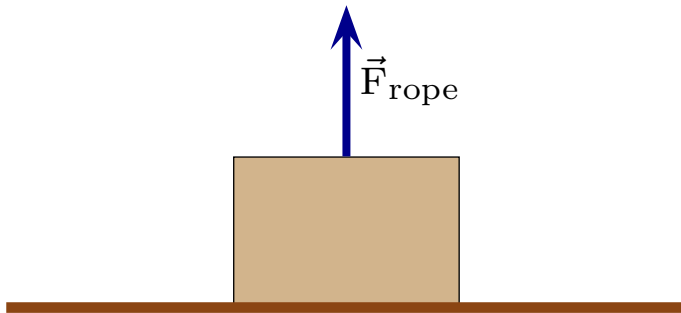


Which of the following is true regarding the magnitude of the normal force exerted by the board on the book?

1. $n = a$
2. $n = ma$
3. $n = mg$
4. $n = ma + mg$
5. $n = ma - mg$
6. $n = mg - ma$

Question 5

A rope pulls upward on a block of mass m that sits along a horizontal surface as illustrated. The block remains in contact with the surface.



Which of the following is true regarding the magnitude of the normal force exerted by the horizontal surface on the block?

1. $n = mg$
2. $n < mg$
3. $n > mg$