

PYP 001
Quiz # 1 (A)

Name: _____

ID : _____

1. A ball is rolling across the top of a billiard table and slowly rolls to stop. How would Aristotle interpret this observation? How would Galileo interpret it?

Ans.: Aristotle: The ball will stop because no force is acting on it
Galileo: The ball will stop because of friction

2. Consider a pair of forces, one having a magnitude of 77 N and the other has a magnitude of 45. What is the maximum net force is possible for these two forces? What is the minimum possible net force? Explain.

Ans. The maximum possible force is $77+45=122$ N if the forces are in the same direction. The minimum possible force is $77-45=32$ N if the forces are in opposite directions.

3. If you pull horizontally on a crate with a force of 200 N and it slides across the floor in dynamic equilibrium, then how much friction is acting on the crate? If it is in mechanical equilibrium then how is the friction?

Ans. The force of friction is equal to the applied force for a system in dynamic equilibrium. Therefore the force of friction= 200 N. Same thing for mechanical equilibrium.

4. What contains more apples: a 10 N bag of apples on Earth, or a 10 N bag of apples on the moon? Explain (acceleration of gravity on the moon is $1/6$ of the acceleration of gravity on the Earth).

Ans. Since the mass is the amount of matter in the bag, we should find the mass of each bag. On earth the mass is 1 Kg, but on moon the mass is 6 Kg. So the bag on the moon contains more apples.

5. Two objects are placed on top of each other as in the figure. What are the magnitude and directions of the forces acting on the 3-Kg object?

Ans. The floor (or the table) applies a force of 50 N (up) on the 3-Kg object. The 2-Kg object applies a force of 20 N (down) on the 3-Kg object.

PYP 001
Quiz # 1 (B)

Name: _____

ID : _____

1. What contains more apples: a 20 N bag of apples on Earth, or a 20 N bag of apples on the moon? Explain (acceleration of gravity on the moon is $1/6$ of the acceleration of gravity on the Earth).

Ans. Since the mass is the amount of matter in the bag, we should find the mass of each bag. On earth the mass is 2 Kg, but on moon the mass is 12 Kg. So the bag on the moon contains more apples.

2. A 4-Kg object is moving with a constant velocity. What is the force necessary to keep this state of motion?

Ans. $F=0$ will keep it in its state of motion. Or in general the net force= 0 .

3. A ball is rolling across the top of a billiard table and slowly rolls to stop. How would Aristotle interpret this observation? How would Galileo interpret it?

Ans.: Aristotle: The ball will stop because no force is acting on it
Galileo: The ball will stop because of friction.

4. Two forces acting on an object, one having a magnitude of 20 N and the other has a magnitude of 12. What is the maximum net force possible on the object? What is the minimum? Explain.

Ans. The maximum possible force is $20+12=32$ N if the forces are in the same direction. The minimum possible force is $20-12=8$ N if the forces are in opposite directions.

5. Two masses are hanging from the ceiling by two strings as shown in the figure. What is the tension in the bottom string? What is the tension in the upper string?

Ans. The tension in the lower string is $2.5 \times 10 = 25$ N. The tension in the upper string is $(2.5+5.5) \times 10 = 80$ N.