Question 1

Which of the following units is equivalent to a newton (N)?

A. kg•m/s
B. g•cm/s
C. kg•cm/s^2
D. kg•s^2/m
E. kg•m/s^2

Question 1

Which of the following units is equivalent to a newton (N)?

A. kg•m/s
B. g•cm/s
C. kg•cm/s^2
D. kg•s^2/m
E. kg•m/s^2   F = ma = kg m / s^2

Question 2

If the sum of all the forces acting on a moving object is zero, the object will
A) slow down and stop
B) change the direction of its motion
C) accelerate uniformly
D) continue moving with constant velocity

Question 2

If the sum of all the forces acting on a moving object is zero, the object will
A) slow down and stop
B) change the direction of its motion
C) accelerate uniformly
D) continue moving with constant velocity

Newton's first law - sometimes referred to as the **law** of inertia:
• An object at rest stays at rest and an object in motion stays in motion with the same speed and in the same direction unless acted upon by an unbalanced force.

Question 3

The force that pulls falling objects toward Earth is called

A. gravity.
B. free fall.
C. acceleration.

Question 3

The force that pulls falling objects toward Earth is called

A. gravity.
B. free fall.
C. acceleration.

Question 4

The force that one surface exerts on another when the two rub against each other is called

A. friction.
B. acceleration.
C. inertia.

Question 4

The force that one surface exerts on another when the two rub against each other is called

A. friction.
B. acceleration.
C. inertia.

Question 5

A spring scale reads 20 newtons as it pulls a 5.0-kilogram mass across a table. What is the magnitude of the force exerted by the mass on the spring scale?

A) 49 N
B) 20 N
C) 4 N
D) 5 N

Question 5

A spring scale reads 20 newtons as it pulls a 5.0-kilogram mass across a table. What is the magnitude of the force exerted by the mass on the spring scale?

A) 49 N
B) 20 N
C) 4 N
D) 5 N

Newton's 3rd Law:
For every action, there is an equal and opposite reaction.

Question 6

The tendency of an object to resist change in its motion (not wanting to change its motion) is known as

A. mass.
B. inertia.
C. force.

Question 6

The tendency of an object to resist change in its motion (not wanting to change its motion) is known as

A. mass.
B. inertia.
C. force.

Question 7

Forces that are equal in size and opposite in direction are known as

A. balanced forces
B. net forces
C. friction forces

Question 7

Forces that are equal in size and opposite in direction are known as

A. balanced forces
B. net forces
C. friction forces

Question 8

A 2.0-kg object is pulled horizontally by a force of 6.3 N along the floor where the coefficient of kinetic friction is 0.24. What is the object's acceleration?

A. 5.5 m/s^2
B. 1.6 m/s^2
C. 2.0 m/s^2
D. 0.80 m/s^2
E. 2.0 m/s^2

Question 8

A 2.0-kg object is pulled horizontally by a force of 6.3 N along the floor where the coefficient of kinetic friction is 0.24. What is the object's acceleration?

A. 5.5 m/s^2
B. 1.6 m/s^2
C. 2.0 m/s^2
D. 0.80 m/s^2
E. 2.0 m/s^2

$F_g = mg = F_N = 2kg * 9.8 \text{ m/s}^2 = 19.6N$

$f_{KE} = \mu_{KE}F_N = 0.24 * 19.6N = 4.7N$

$F_{NET} = 6.3N - 4.7N = 1.6N$

$F_{NET} = ma$

$a = F_{NET} / m = 1.6N / 2kg =$

Question 9

According to Newton's third law of motion, when a hammer strikes and exerts force on a nail, the nail

A. creates a friction with the hammer.
B. disappears into the wood.
C. exerts an equal force back on the hammer.
D. moves at a constant speed.

Question 9

According to Newton's third law of motion, when a hammer strikes and exerts force on a nail, the nail

A. creates a friction with the hammer.
B. disappears into the wood.
C. exerts an equal force back on the hammer.
D. moves at a constant speed.

Newton's 3rd Law:
For every action, there is an equal and opposite reaction.

Question 10

When an object is at rest on a horizontal surface, what force acts upward on the box?

A. Normal force
B. The weight of the box
C. Frictional force
D. There are no forces on the box

Question 10

When an object is at rest on a horizontal surface, what force acts upward on the box?

A. **Normal force**
B. The weight of the box
C. Frictional force
D. There are no forces on the box

Question 11

What is a Newton a unit of?

A) Mass
B) Acceleration
C) Weight
D) Gravity

Question 11

What is a Newton a unit of?

A) Mass
B) Acceleration
C) **Weight**
D) Gravity

Question 11

When two bodies push on each other, their forces are...?

A. Weight and reaction
B. Unbalanced and equal
C. Equal and opposite
D. Balanced and identical
E. Friction and gravity

Question 11

When two bodies push on each other, their forces are...?

A. Weight and reaction
B. Unbalanced and equal
C. **Equal and opposite**
D. Balanced and identical
E. Friction and gravity

Question 12

The direction of kinetic friction is always _____ to the direction the object is moving.

A) Equal
B) Opposite
C) Unrelated
D) None of the above

Question 12

The direction of kinetic friction is always _____ to the direction the object is moving.

A) Equal
B) **Opposite**
C) Unrelated
D) None of the above

Question 13

When an object is at rest on a horizontal surface, what force acts downwards on the box?

A. Normal force
B. The weight of the box
C. Frictional force
D. There are no forces on the box

Question 13

When an object is at rest on a horizontal surface, what force acts downwards on the box?

A. Normal force
B. **The weight of the box**
C. Frictional force
D. There are no forces on the box

Question 14

How will the mass of an object affect the way it speeds up or slows down?

A) No effect
B) More massive objects are easier to accelerate and harder to decelerate
C) More massive objects are harder to both accelerate and decelerate
D) More massive objects are easier to both accelerate and decelerate
E) Impossible to say

Question 14

How will the mass of an object affect the way it speeds up or slows down?

A) No effect
B) More massive objects are easier to accelerate and harder to decelerate
C) **More massive objects are harder to both accelerate and decelerate** $F = ma$
D) More massive objects are easier to both accelerate and decelerate
E) Impossible to say

Question 15

To keep a heavy box sliding across a carpeted floor at constant speed, a person must continually exert a force on the box. This force is used primarily to overcome which of the following forces?

A. Air resistance
B. The weight of the box
C. The frictional force exerted by the floor on the box

Question 15

To keep a heavy box sliding across a carpeted floor at constant speed, a person must continually exert a force on the box. This force is used primarily to overcome which of the following forces?

A. Air resistance
B. The weight of the box
C. **The frictional force exerted by the floor on the box**

Question 16

• If the earth exerts a gravitational force on an apple pie, the apple pie exerts

A) Less force on the earth
B) The same force on the earth
C) More force on the earth
D) Unknown amount of force on the earth

Question 16

• If the earth exerts a gravitational force on an apple pie, the apple pie exerts

A) Less force on the earth
B) **The same force on the earth**
C) More force on the earth
D) Unknown amount of force on the earth

Newton's 3rd Law:
For every action, there is an equal and opposite reaction.

Question 17

• A person stands on a scale that rests on the floor of an elevator. When the elevator is stationary the scale registers 500 N. When the elevator accelerates upwards the scale registers 600 N. Taking the acceleration of gravity to be 10 m/s^2, the best estimate for the acceleration of the elevator is

A) 190 m/s^2
B) 11 m/s^2
C) 8 m/s^2
D) 2 m/s^2

Question 17

• A person stands on a scale that rests on the floor of an elevator. When the elevator is stationary the scale registers 500 N. When the elevator accelerates upwards the scale registers 600 N. Taking the acceleration of gravity to be 10 m/s^2, the best estimate for the acceleration of the elevator is

A) 190 m/s^2
B) 11 m/s^2
C) 8 m/s^2
D) **2 m/s^2**

$F_g = mg$
$m = F_g / g = 500N / 10 m/s^2 = 50kg$

$F_{NET} = 600N - 500N = 100N = ma$
$a = F_{NET} / m = 100N / 50kg$

http://physics.usask.ca/~kathryn/phys111/apparent_weight.pdf

Question 18

An ice cube slides to the left at a constant velocity. Which of the following must be true:

A. The net force on the ice cube is to the left.
B. No forces are acting on the ice cube.
C. The only force acting is downward.
D. No net force is acting on the ice cube.

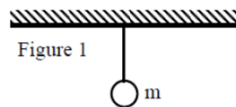## Question 18

An ice cube slides to the left at a constant velocity. Which of the following must be true:

A. The net force on the ice cube is to the left.
B. No forces are acting on the ice cube.
C. The only force acting is downward.
D. No net force is acting on the ice cube.

Newton's first law - sometimes referred to as the **law** of inertia:
• An object at rest stays at rest and an object in motion stays in motion with the same speed and in the same direction unless acted upon by an unbalanced force.

Question 19

A small ball of mass m=100 g hangs at rest by a massless inextensible string from the ceiling of a railway car.
The tension in the string is

A. 0.98 N
B. 9.8 N
C. 0 N
D. Other
E. Can't tell. There is not enough information.

Figure 1

m

Question 19

A small ball of mass m=100 g hangs at rest by a massless inextensible string from the ceiling of a railway car.
The tension in the string is

A. 0.98 N
B. 9.8 N
C. 0 N
D. Other
E. Can't tell. There is not enough information.

Figure 1

m
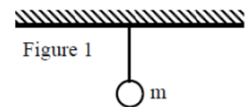
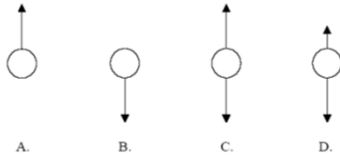$$F_g = mg = 0.1kg * 9.8 \text{ m/s}^2 = 0.98N = F_T \text{ (as at rest)}$$

Question 20

Which of the following is an example of Newton's third law?

A) When friction acts on a moving body, it decelerates.
B) When your car pushes down on the road, the road pushes back on the car.
C) A more massive body is harder to get moving than a less massive body.
D) The normal force exerted on a body and the weight of the body.

Question 20

Which of the following is an example of Newton's third law?

A) When friction acts on a moving body, it decelerates.
B) When your car pushes down on the road, the road pushes back on the car.
C) A more massive body is harder to get moving than a less massive body.
D) The normal force exerted on a body and the weight of the body.
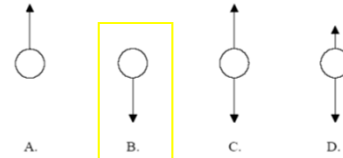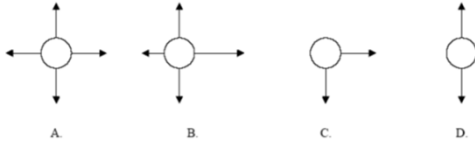
Question 21

A ball is thrown vertically upward. If air resistance is negligible, which one of the diagrams below is the correct free body diagram showing the forces on the ball when it is on the way up?
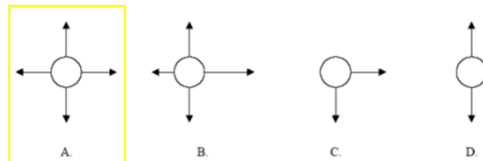
A.   B.   C.   D.

Question 21

A ball is thrown vertically upward. If air resistance is negligible, which one of the diagrams below is the correct free body diagram showing the forces on the ball when it is on the way up?

A.   B.   C.   D.

Question 22

A car is travelling to the right on a level highway at a constant velocity in a straight line. Air resistance is NOT negligible. Which of the following is the correct free body diagram for the car?

A.   B.   C.   D.

Question 22

A car is travelling to the right on a level highway at a constant velocity in a straight line. Air resistance is NOT negligible. Which of the following is the correct free body diagram for the car?

A.   B.   C.   D.

Question 23

F_{norm}

True or False: This diagram would only apply to an object resting on a supporting surface. Assume the arrows are the same length.

A. true
B. false
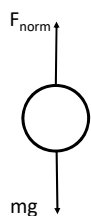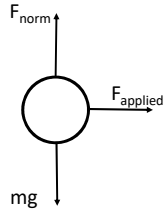
mg

Question 23

F_{norm}

True or False: This diagram would only apply to an object resting on a supporting surface. Assume the arrows are the same length.

A. true
B. false

mg

31/01/2018

Question 24

True or False: According to this diagram, the object is accelerating to the right on a frictionless, supporting surface.

A. true
B. false

F_{norm} ↑
$F_{applied}$ →
mg ↓

Question 24

True or False: According to this diagram, the object is accelerating to the right on a frictionless, supporting surface.
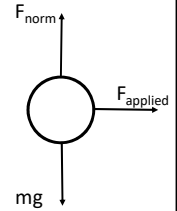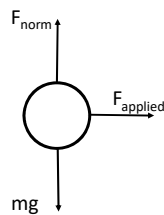
A. true
B. false

F_{norm} ↑
$F_{applied}$ →
mg ↓

Question 25

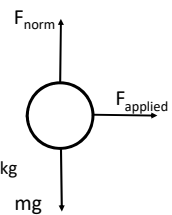If this object weighs 49 N and the applied force equals 10 N, what is the magnitude of the resulting acceleration?

A) 490 m/s²
B) 50 m/s²
C) 4.9 m/s²
D) 500 m/s²
E) 2.04 m/s²

F_{norm} ↑
$F_{applied}$ →
mg ↓

Question 25

If this object weighs 49 N and the applied force equals 10 N, what is the magnitude of the resulting acceleration?

A) 490 m/s²
B) 50 m/s²
C) 4.9 m/s²
D) 500 m/s²
E) 2.04 m/s²

$F_g = mg$
$m = F_g / g = 49N / 10 m/s^2 = 4.9kg$

$F = ma$
$a = F / m = 10N / 4.9kg = 2.04 m/s^2$

F_{norm} ↑
$F_{applied}$ →
mg ↓

Question 26

True or False: According to this free body diagram, the object is moving at a constant velocity, towards the left, across a supporting surface in the presence of friction..
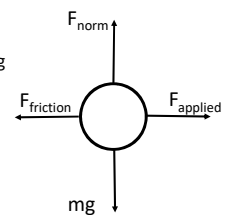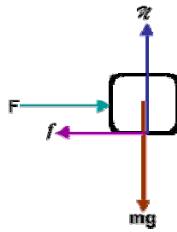
A. True
B. false

F_{norm} ↑
$F_{friction}$ ←
$F_{applied}$ →
mg ↓

Question 26

True or False: According to this free body diagram, the object is moving at a constant velocity, towards the left, across a supporting surface in the presence of friction..

A. True
B. false

F_{norm} ↑
$F_{friction}$ ←
$F_{applied}$ →
mg ↓

Question 27

If the object is moving at a constant velocity and it weighs 49 N and the applied force equals 10 N, what is the magnitude of the frictional force present between the object and the supporting surface?
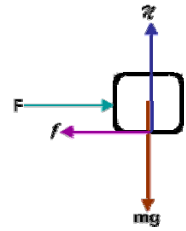
A) 5 N
B) 10 N
C) 49 N
D) It depends on the friction coefficient

Question 27

If the object is moving at a **constant velocity** and it weighs 49 N and the applied force equals 10 N, what is the magnitude of the frictional force present between the object and the supporting surface?

A) 5 N
B) 10 N
C) 49 N
D) It depends on the friction coefficient

Newton's first law - sometimes referred to as the **law** of inertia:
- An object at rest stays at rest and an object in motion stays in motion with the same speed and in the same direction unless acted upon by an unbalanced force.

Question 28

Which choice is correct? This object is

A) moving to the left and gaining speed.
B) moving to the left and losing speed.
C) moving to the right and gaining speed.
D) moving to the right and losing speed.
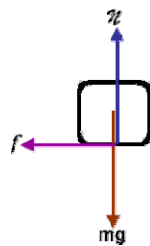
Question 28

Which choice is correct? This object is

A) moving to the left and gaining speed.
B) moving to the left and losing speed.
C) moving to the right and gaining speed.
D) moving to the right and losing speed.
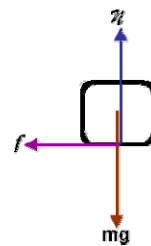
Question 30

True or False: This free body diagram would only apply to an object being raised vertically at a constant velocity.

A) True
B) False

Question 30

True or False: This free body diagram would only apply to an object being raised vertically at a constant velocity.

A) True
B) False

Question 31

• **True or False:** This free body diagram could apply to an object in freefall only while it is descending.

A) True
B) False

Question 31

• **True or False:** This free body diagram could apply to an object in freefall only while it is descending.

A) True
B) False

Question 32

Which of the following situations would produce the greatest acceleration?

A. A 1.0-N force acting west and a 2.0-N force acting east on a 1.0-kg object.
B. A 3.0-N force acting west and a 5.0-N force acting east on a 2.0-kg object.
C. A 8.0-N force acting west and a 5.0-N force acting east on a 3.0-kg object.
D. A 8.0-N force acting west and a 12.0-N force acting east on a 4.0-kg object.
E. A 1.0-N force acting west and a 9.0-N force acting east on a 5.0-kg object.

Question 32

$$F = ma$$
$$a = \frac{F}{m}$$

Which of the following situations would produce the greatest acceleration?

A. A 1.0-N force acting west and a 2.0-N force acting east on a 1.0-kg object. $\frac{1}{1}$
B. A 3.0-N force acting west and a 5.0-N force acting east on a 2.0-kg object. $\frac{2}{2}$
C. A 8.0-N force acting west and a 5.0-N force acting east on a 3.0-kg object. $\frac{3}{3}$
D. A 8.0-N force acting west and a 12.0-N force acting east on a 4.0-kg object. $\frac{4}{4}$
E. A 1.0-N force acting west and a 9.0-N force acting east on a 5.0-kg object. $\frac{8}{5} = 1.6$

Question 33

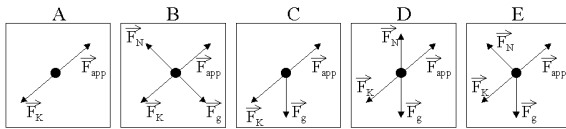**Which are possible motion states for this Free body diagram?**

A) The object is moving upwards at a constant velocity
B) The object is moving upwards and speeding up
C) The object is moving downwards and slowing down
D) The object is moving downwards and speeding up
E) The object is moving upwards and slowing down
F) Both B and C
G) Both D and E

Question 33

Which are possible motion states for this Free body diagram?

A) The object is moving upwards at a constant velocity
B) The object is moving upwards and speeding up
C) The object is moving downwards and slowing down
D) The object is moving downwards and speeding up
E) The object is moving upwards and slowing down
F) Both B and C
G) Both D and E
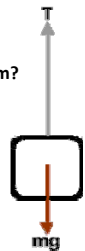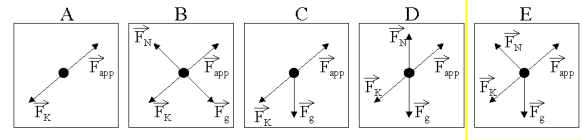
Really just Grade 8

Question 34

The free-body diagram of a block being pushed up a rough ramp is best represented by

A B C D E

Really just Grade 8

Question 35

An object sits at rest on a ramp. As the angle of inclination of the ramp increases, the object suddenly begins to slide. Which of the following explanations best accounts for the object's movement?

A) The coefficient of static friction has decreased sufficiently.
B) The force of gravity acting on the object has increased sufficiently.
C) The component of gravity along the ramp has increased sufficiently.
D) The friction has decreased sufficiently while the normal force has remained unchanged.
E) The normal force has increased sufficiently.