Final Review Practice B

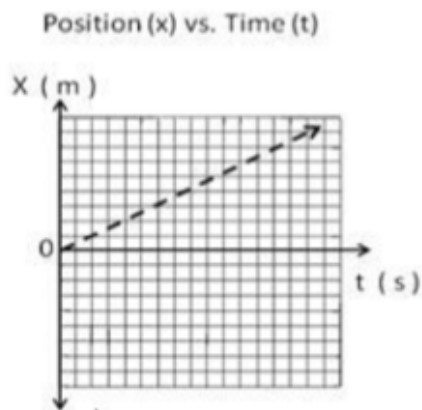⚠ **This is a preview of the draft version of the quiz**

Started: Dec 16 at 10:10am

Quiz Instructions

The focus is on Kinematic Graphs, but includes some kinematic equations, Newton's laws, and vectors.

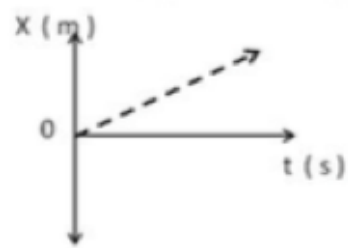| Question 1	1 pts

Position (x) vs. Time (t)

X (m)

0

t (s)

Using the Position (x) vs. Time (t) graph above, select the statement that describes the object's motion.

○ A car drives up a slope.

○ A car moves at a constant speed.

○ A car moves faster as time passes.

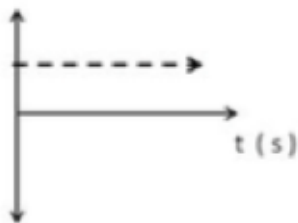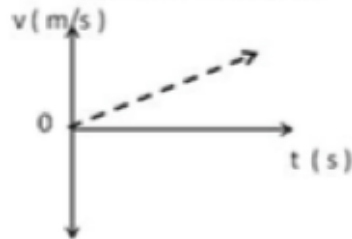○ A car is moving with random motion.

Question 2	1 pts

Position (x) vs. Time (t)

X (m)

0

t (s)

A　　　　　　　　　　　　B　　　　　　　　　　　　C

Velocity (v) vs. Time (t)　　Velocity (v) vs. Time (t)　　Velocity (v) vs. Time (t)

v (m/s)　　　　　　　　　v (m/s)

0　　　　　　　　　　　　　0

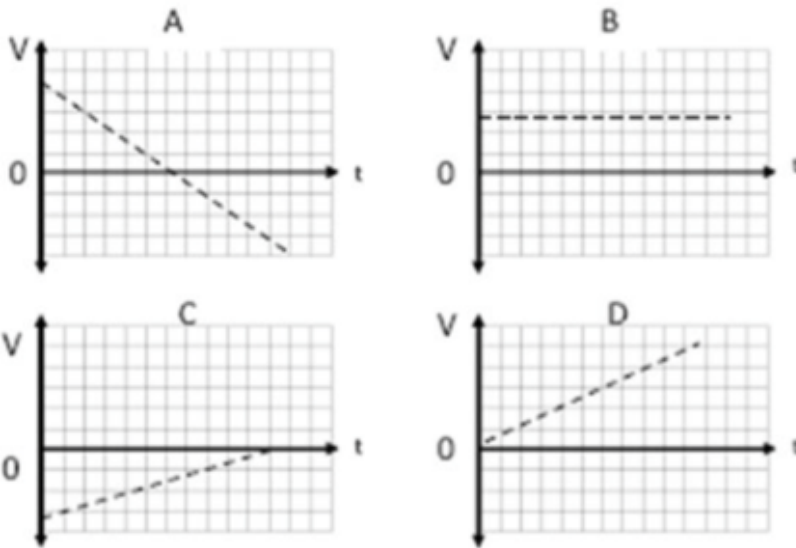t (s)　　　　　　　　t (s)　　　　　　　　t (s)
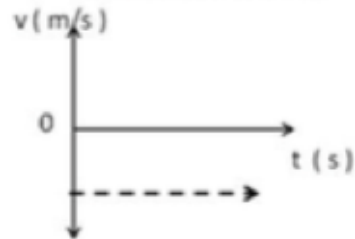
Examine the position vs. time graph. Select the velocity vs. time graph that describes the same motion.

○ C

○ None of the above

○ B

○ A

Question 3   1 pts

A

B

C

D

A ball is resting at the top of an incline. It begins to roll down the slope. Select the velocity vs. time graph that shows how velocity changes while it is rolling down the slope.

○ B

○ A

○ C

○ D

Question 4   1 pts
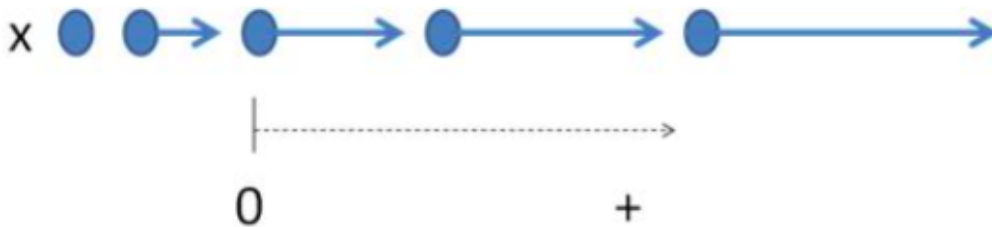
The motion diagram above shows the velocity vectors for one second intervals for the motion of a toy car. Select the statement that describes the toy's motion.

○ The car is speeding up as it moves in the positive direction.

○ The car is slowing down as it moves in the negative direction.

○ The car is speeding up as it moves in the negative direction.

○ The car is slowing down as it moves in the positive direction.

Question 5   1 pts

X (m)   Position versus Time

A   B   C   D   E

t (s)
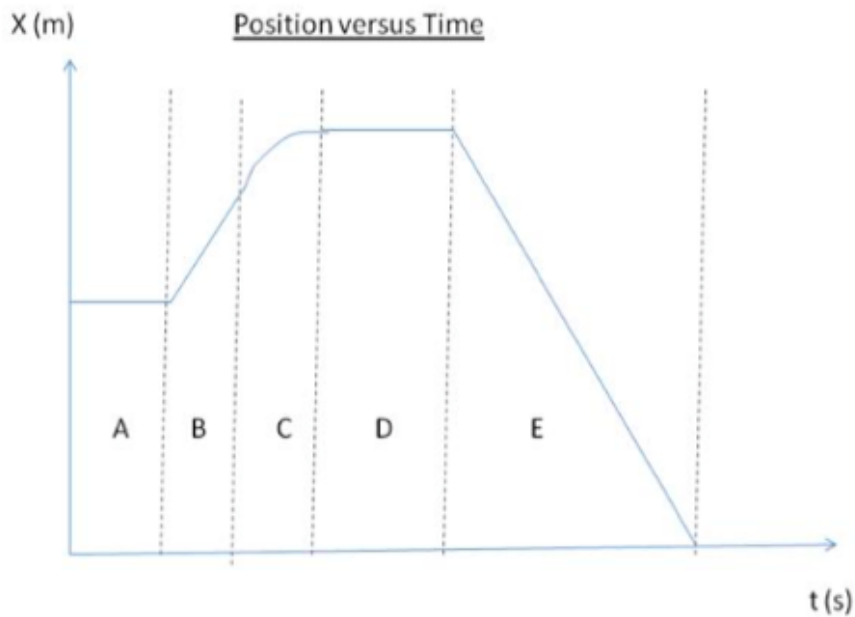
During which interval is the object acted on by an unbalanced force?

○ D

○ C

○ B

○ E

○ A

Question 6   1 pts

Walker ➔ - 5 m/s

← ────────── Bus
25 m/s
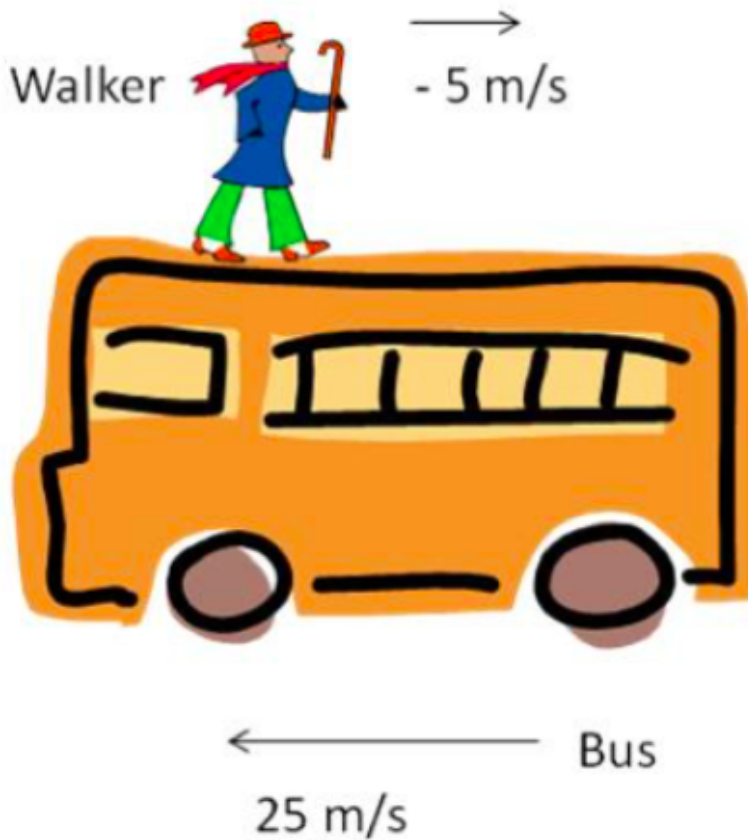
A man is walking toward the back of a moving bus at 5 meters per second. If the bus is moving in the opposite direction than the walker, how fast is the walker moving compared to the ground?

○ 20 m/s

○ -20 m/s

○ 5 m/s

○ -5 m/s

Question 7   **1 pts**

Two joggers are running at the same speed in opposite directions.
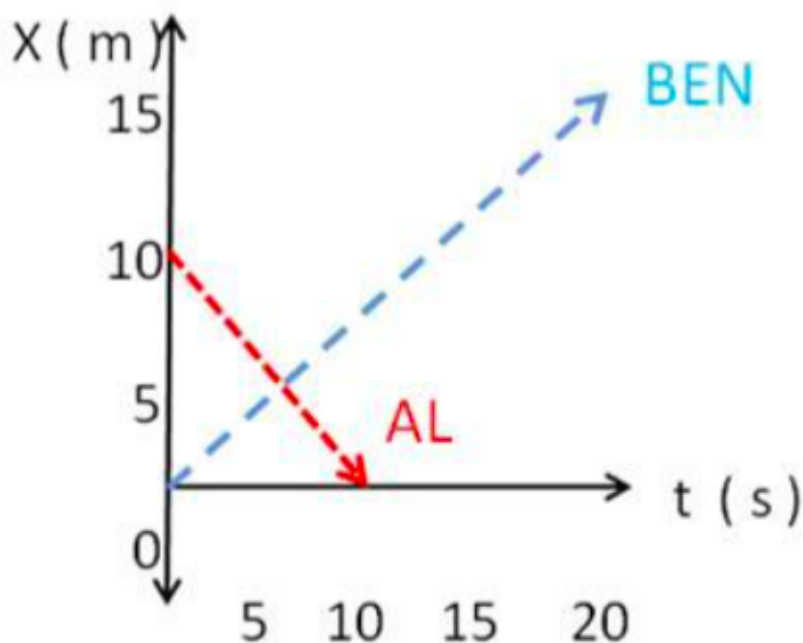
Select the statement that must be true:

○ The runners start together.

○ The runners have different speeds.

○ One runner has a positive velocity. The other runner has a negative velocity.

○ The runners have the same velocity.

Question 8   1 pts

Al and Ben are taking a walk along the same path. Select the best description of their walks.

○ Ben and Al start walking from the same place. Al walks faster and passes Ben about 5 seconds after they begin.

○ Ben and Al start walking toward each other at the same time. About 5 seconds after they begin, they meet on the path.

○ Ben and Al start walking from the same place. Ben walks farther than Al.

○ Ben and Al start walking at the same time. They walk in the same directions.

Question 9

1 pts

Data Table A

Time (seconds)	Position (meters)
0	0
1	50
2	100
3	150
4	200

$$V = \frac{\text{Change in position}}{\text{Change in time}}$$

$$a = \frac{\text{Change in velocity}}{\text{Change in time}}$$

Data Table A shows the position of an object as it moves along a linear path. Based on the data provided, determine the object's average acceleration.

○ The average acceleration is 50 m/s.

○ The average acceleration is 0 m/s.

○ The average acceleration is 0 m/s/s.

○ The average acceleration is 50 m/s/s.

Question 10

1 pts

You are watching a ball rolling along level ground. You notice that it rolls the same distance in every equal interval of time. Based on this observation, you conclude that:

○ The ball is speeding up.

○ The ball is slowing down.

○ The ball is moving at a constant velocity.

○ The ball's motion is not uniform.

Question 11

1 pts

$$F_N \quad\quad F_N \quad\quad F_N$$

$$F_A \quad\quad \quad\quad F_f \quad F_A$$

$$F_g \quad\quad F_g \quad\quad F_g$$
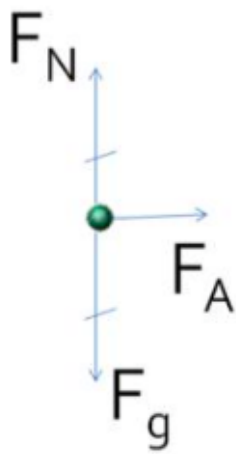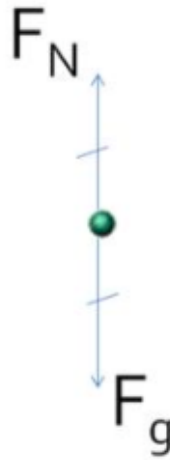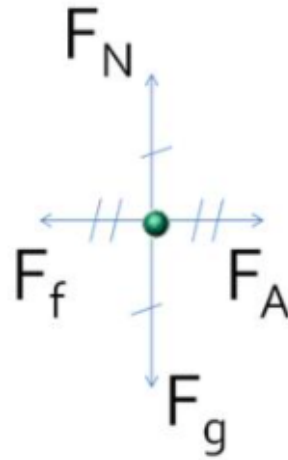
I   **II**   **III**

A book is resting on a table. Which of the force diagrams above could show the forces on the book?

○ I only

○ II and III

○ III only

○ II only

○ I and II

Question 12

1 pts

7 N

5 N

7 N

Select the statement that matches the force diagram.

○ The vertical forces are 10 newtons upward.

○ The vertical forces are unbalanced.

○ The horizontal forces are balanced.

○ The horizontal net force is 5 newtons to the right.

Question 13   **1 pts**

An apple is resting on a book. What are the forces acting on the apple?

○ The normal force only.

○ The force due to gravity and the normal force.

○ The apple's weight only.

○ The force due to gravity only.

Question 14   1 pts

Sally and Ari are sitting on a bridge above a lake. Each of them has a rock that is the same size and shape. However, Ari's rock is much heavier than Sally's rock. The day is clear and calm, so no air friction will affect the rocks as they fall. If they drop them at the same time:

○ Both rocks will hit the water at the same time.

○ Ari's rock will hit the water first since heavier things fall faster than lighter things.

○ Sally's rock will hit the water first since lighter things fall faster than lighter things.

○ It is not possible to predict when the rocks will strike the water.

Question 15   1 pts

The concept of 'free fall' includes a specific assumption about the forces acting on the object while it is in 'free fall'. Which of the following assumptions must be true?

○ The frictional force created by air resistance is equal to the weight of the object.

○ The object's velocity is in the same direction as gravity's acceleration.

○ The object's mass will change as it falls.

○ The only force acting on the object is the force due to gravity.

Question 16   1 pts
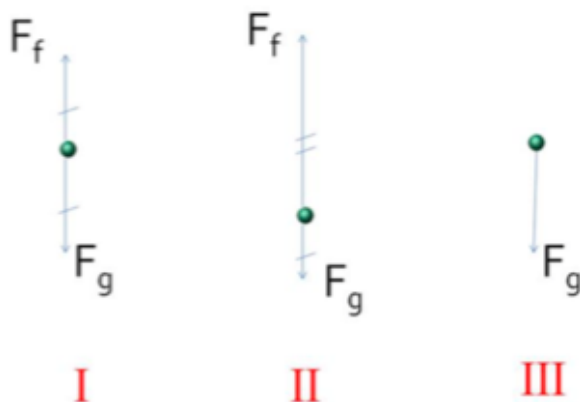
Review the three force diagrams. Which force diagram shows an object that is in free fall?

○ I

○ III

○ II

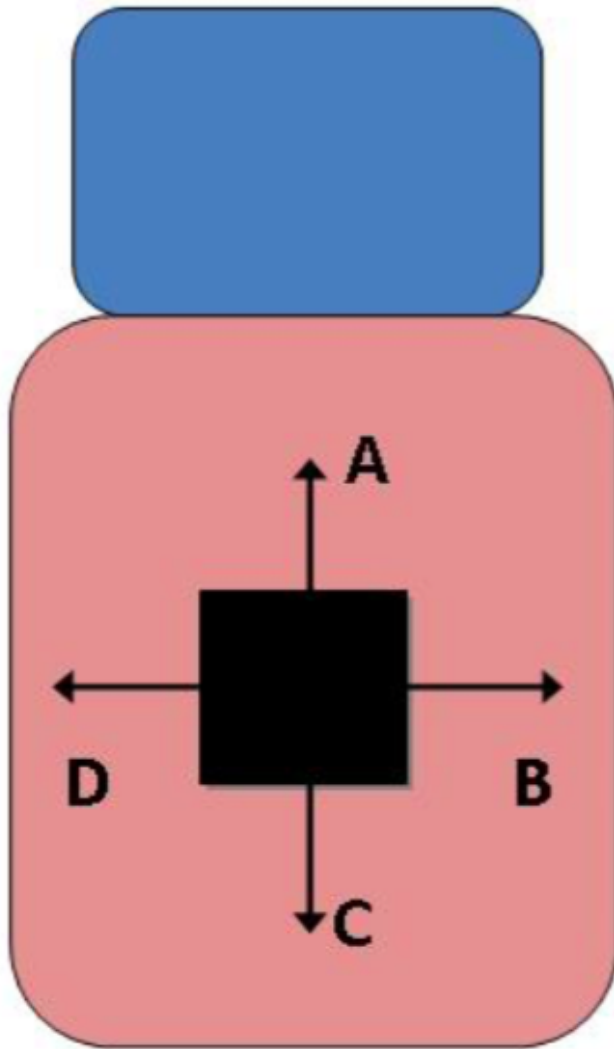---

Question 17   **1 pts**

Three crates are sitting on a warehouse floor. The crates are different sizes and weights. What property will determine which crate is hardest to move?

○ The texture of the floor.

○ The temperature of the crate and the floor.

○ The size of the crate.

○ The mass of the crate.

Question 18   **1 pts**

Truck traveling North

You are looking down on a truck traveling north. A suitcase lies in the truck bed. The driver of the truck suddenly stops. Which direction will the suitcase lying on the frictionless truck bed move? (The arrows represent directions of possible movement, not a force diagram.)

○ D

○ B

○ C

○ A

Question 19

1 pts

A spaceship from deep space fires its engines for 3 seconds. Which describes its motion at the end of the 3 seconds when the engines are turned off?

○ The spaceship moves with constant speed.

○ The spaceship gradually slows down.

○ The spaceship continues to accelerate.

○ The spaceship moves with increasing speed, then the speed gradually slows down.

Question 20

1 pts

$$F = m\,a$$

F = 45 N

m = 15 kg

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

$$m = \frac{F}{a}$$
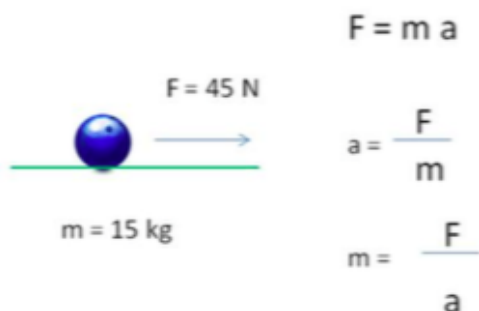
A 15 kilogram ball rolls along a surface. If the net force on the ball is 45 newtons to the right, the ball's acceleration along the surface will be:

○ 3 m/s/s to the right

○ 675 m/s/s to the right

○ 30 m/s/s to the right

○ 0 m/s/s to the right

○ 5 m/s/s to the right

Question 21   1 pts

A student weighs 200 Newtons. He is in an elevator that is accelerating upward at 2 m/s/s. If he stands on a scale in the moving elevator, the scale reading will be about:

○ 200 N

○ 160 N

○ 400 N

○ 240 N

Question 22   1 pts

A student is sitting still in a chair. How does the force that the student exerts on the chair compare to the force that the chair exerts on the student?

○ The same magnitude and the same direction.

○ A smaller magnitude and the same direction.

○ The same magnitude but the opposite direction.

○ A larger magnitude but the opposite direction.

Question 23   1 pts

A ball is launched straight up in a friction-free environment. Consider the force on the ball as it flies upward to its peak and falls back to the ground. Compare the force on the ball as it flies upward to the force on the ball as it falls.

○ The force on the ball is the same going up and falling down.

○ The force on the ball is greater as it falls back toward the ground.

○ The force on the ball at the peak is zero.

○ The force on the ball is less as it falls back toward the ground.

Question 24   1 pts

Position (x) vs. Time (t)
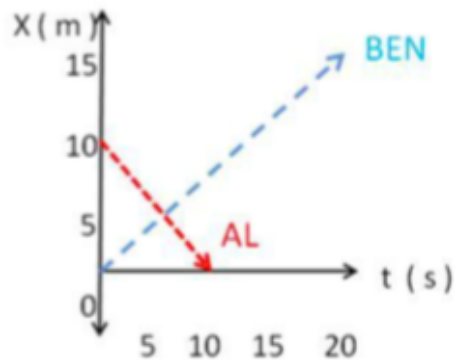
After completing an experiment, Ben and Al have graphed their data. Based on the graph shown, the independent variable in their experiment is:

○ Velocity

○ Time

○ Speed

○ Position

Question 25   1 pts

What are the components of a valid experiment?

○ Temperature, Control of Constants, Multiple Trials

○ Independent Variable, Dependent Variable

○ Control of Constants, Multiple Trials

○ Independent Variable, Dependent Variable, Control of Constants, Multiple Trials

Question 26   1 pts

Toy car's Position in four trials
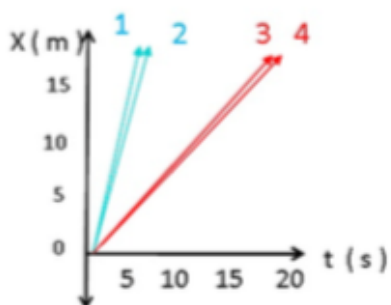
A group of physics students begins an experiment at school. They collect data on the position of a toy car as it moves along a 15 meter track. They complete only 2 of the 4 required trials during class, so they plan to finish the experiment after school. They meet after school to complete the 3rd and 4th trials. To analyze their data, they create a line graph above showing the changing position of the toy car.

What is a possible explanation for the difference in the trial results?

⚪ The students rushed through the 3rd and 4th trials, so their results were less valid.

⚪ The students put fresh batteries in their lab car.

⚪ By the end of the day, the toy cars did not work as well. Their results would have better if they had done their 3rd and 4th trials before school the following day.

⚪ The students used the same lab car, but other students had depleted the battery by using it throughout the day.

Question 27   1 pts

Mass $_A$ = 400 kg

Force $_A$ = 200 N

Force $_B$ = ???

Mass $_B$ = 200 kg

Two race cars of different masses accelerate at the same rate from the starting line of a race. The relationship between force, mass and acceleration is expressed mathematically as Fnet = m a . What force must be applied to car B?
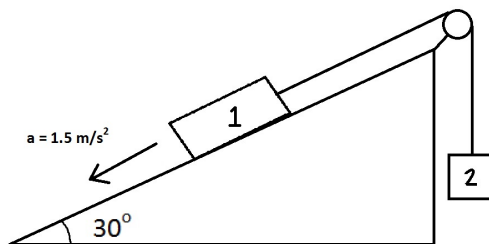
○ 100 N

○ 20 N

○ 50 N

○ 200 N

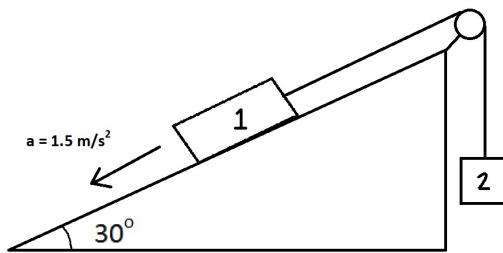## Question 28   1 pts

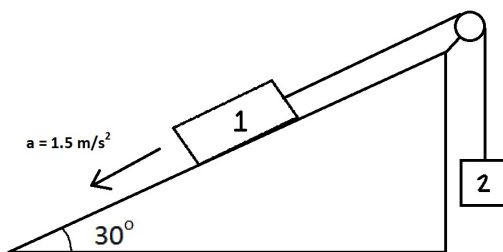Between block 1 and the ramp, the coefficient of static friction is .3. The coefficient of kinetic friction is .2.

How many forces are acting on block 1?

a = 1.5 m/s^2

1

2

30°

○ 3

○ 2

○ 0

○ 4

○ 1

Question 29   1 pts

Assuming no friction, how many forces are acting on block 1?

○ 0

○ 1

○ 4

○ 3

○ 2

Question 30   1 pts

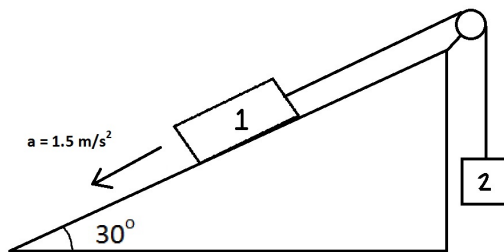The normal force acting on block 1 is _____ to the ramp.

○ perpendicular

○ parallel

Question 31   1 pts

The direction of weight force on block 1 is _____.

○ pointed straight down toward the center of the earth

○ perpendicular to the ramp

○ parallel to the ramp

Question 32   1 pts

The slope of the position-time graph is _____ and has the unit _____.

○ distance, meters

○ acceleration, m/s

○ velocity, m/s/s

○ velocity, m/s

○ acceleration, m/s/s

Not saved   Submit Quiz