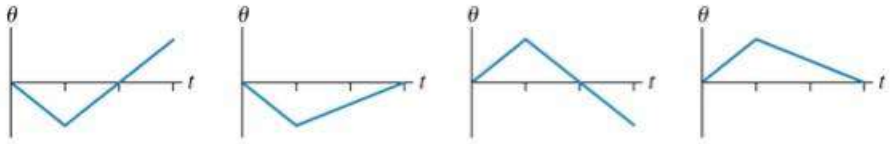
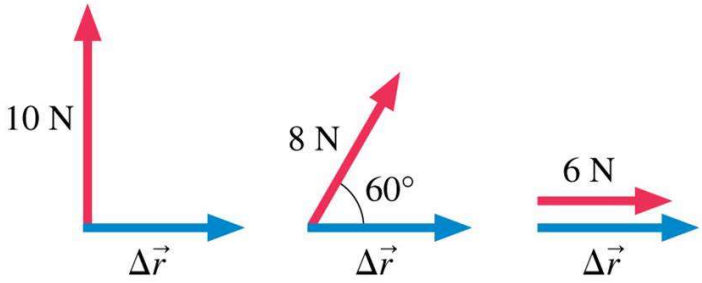
A particle moves cw around a circle at constant speed for 2.0 s. It then reverses direction and moves ccw at half the original speed until it has traveled through the same angle. Which is the particle's angle-versus-time graph?



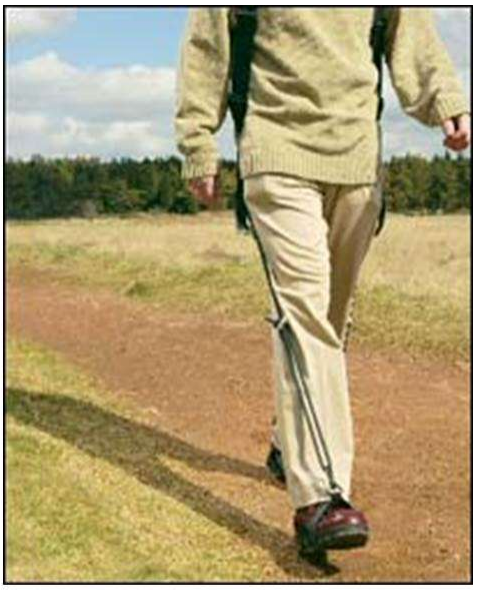
(1) (2) (3) (4)



Which force does the most work? (Assume the magnitude of the displacement in each case is the same.)

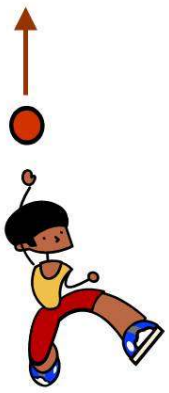
1. Not enough information, as the magnitude of the displacement is needed to calculate the work done by a force.
2. The 6 N force.
3. The 8 N force.
4. The 10 N force.
5. They all do the same amount of work.

You are standing at rest and begin to walk forward. What force pushes you forward?



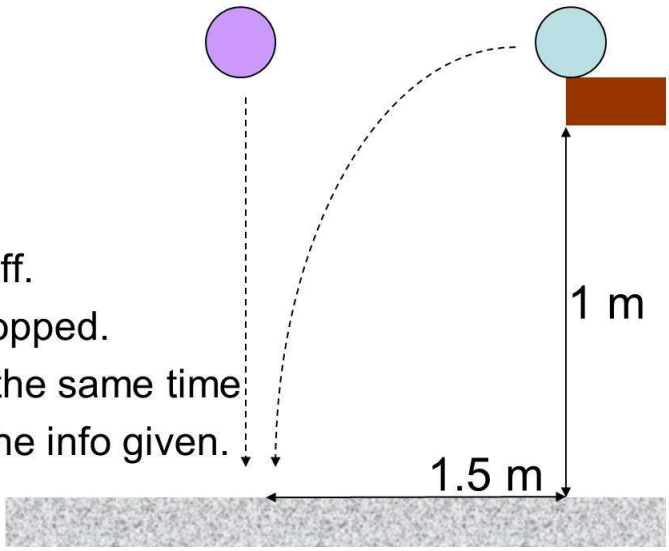
A. the force of your feet on the ground
B. the force of your acceleration
C. the force of your velocity
D. the force of your momentum
E. the force of the ground on your feet

You throw a ball vertically upward. Which statement best describes the ***direction and magnitude*** of the ball's ***acceleration*** while the ball is still moving up?



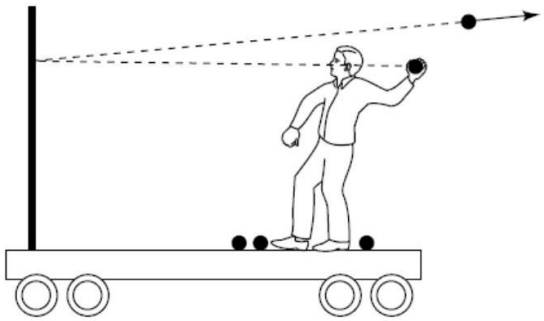
1. Upward, constant magnitude
2. Upward, increasing magnitude
3. Upward, decreasing magnitude
4. Downward, constant magnitude
5. Downward, increasing magnitude
6. Downward, decreasing magnitude
7. Zero acceleration

The same ball is rolled off the edge of the 1 meter high table again. This time it is rolling faster so it lands on the floor farther away from the table at 1.5 meters away from the edge of the table. If another ball is again **released from rest** at a height of 1.0 meters the instant the first ball rolls off the table, which ball will hit the floor first?



1. The ball that rolled off.
2. The ball that was dropped.
3. They will both hit at the same time
4. You can't tell from the info given.

Suppose you are on a cart, initially at rest on a track with very little friction. You throw heavy balls at a wall that is rigidly attached to the cart. If the balls bounce back as shown in the figure, which of the following statements about the cart's motion, is true?

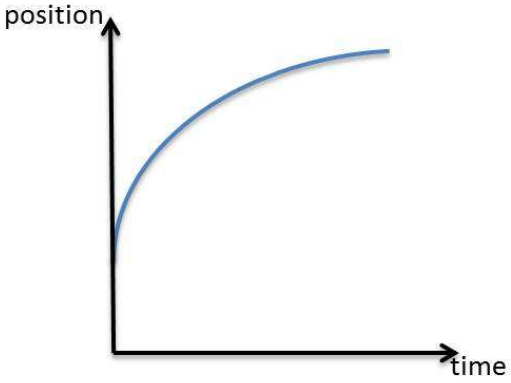


A) After several balls the cart moves to the right.

B) After several balls the cart moves to the left.

C) Overall, the cart doesn't move.

A train moves along a long straight track. The graph shows the position as a function of time for this train. How does the speed of the train vary during the time interval shown?

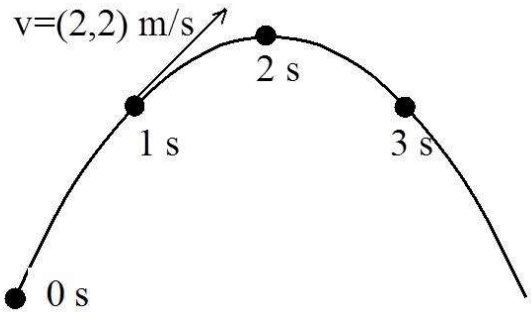


The graph shows that the train:

A) speeds up all the time.
B) slows down all the time.
C) speeds up part of the time and slows down part of the time.
D) moves at a constant velocity.

A physics student on Planet Meepzorp throws a ball that follows the parabolic trajectory shown. The balls position is shown at 1 second intervals.

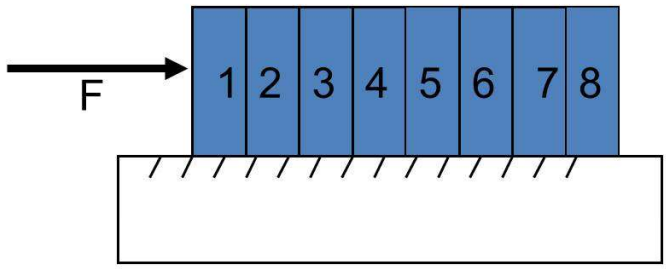
At t=1 s, the balls velocity is **v**= (2**i** + 2**j**) m/s.



What is the magnitude of the acceleration due to gravity on Planet Meepzorp (in m/s^2)?

A) 9.8
B) 2
C) 4
D) Sqrt[8]
E) Not enough information.

Tom now pushes eight identical blocks on the horizontal and frictionless table (he's compulsive). The force that block 1 exerts on block 2 is F_{12}; the force that block 7 exerts on block 8 is F_{78}.



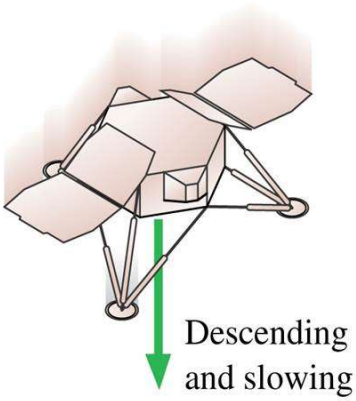
What is the ratio F_{12}/ F_{78}?

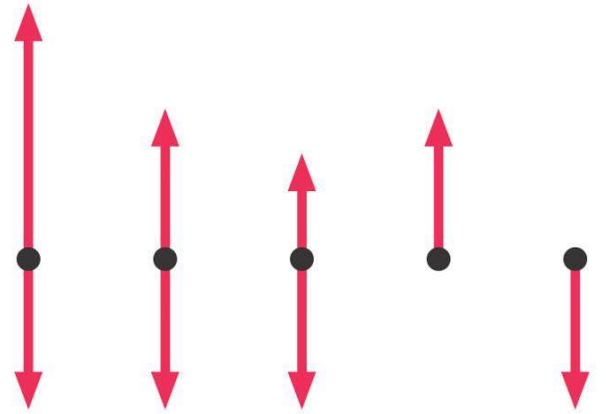
a) 8
b) 1/8
c) 1
d) 7
e) 1/7

A cart with mass m_2 is connected to a mass m_1 using a string that passes over a frictionless pulley, as shown below. Initially, the cart is held motionless. After the cart is released, the tension in the string

1. Increases.
2. Decreases.
3. Remains the same.
4. Cannot tell from the information given.

A Martian lander is approaching the surface. It is slowing its descent by firing its rocket motor. Which is the correct free-body diagram for the lander?



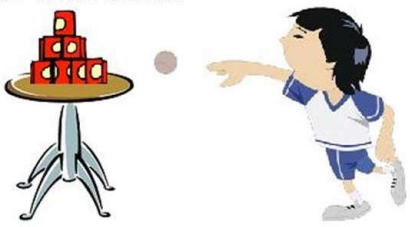


(1) (2) (3) (4) (5)

At an amusement park, you decide to play a game where you throw balls at a block in order to knock it over. You are given the choice to throw one of two balls. Each ball has the same mass, however one will stick to the block and the other will bounce.

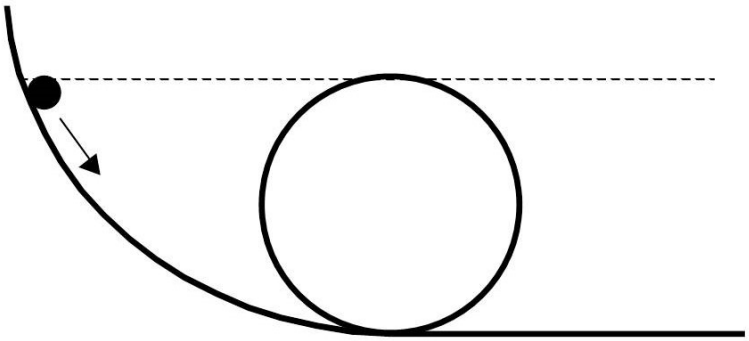
Which should you choose to throw in order to give yourself the best chance of knocking the block over? Assume that you will throw either ball at the same speed.

a) The ball that will stick
b) The ball that will bounce
c) Either ball will give you equal chances of knocking the block over.
d) Depends on if block is lighter or heavier that balls.

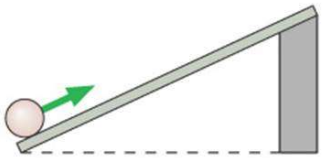


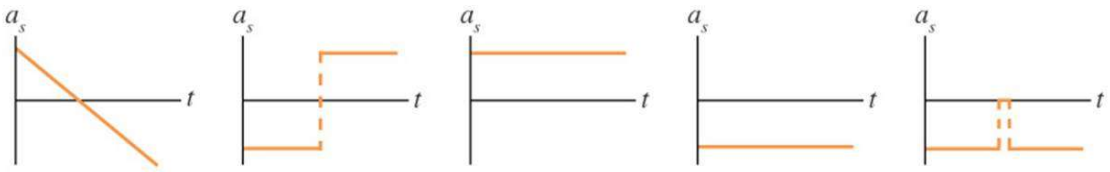
A small mass, starting at rest, slides without friction down a rail to a loop-de-loop as shown. The maximum height of the loop is the same as the initial height of the mass.

Will the ball make it to the top of the loop?

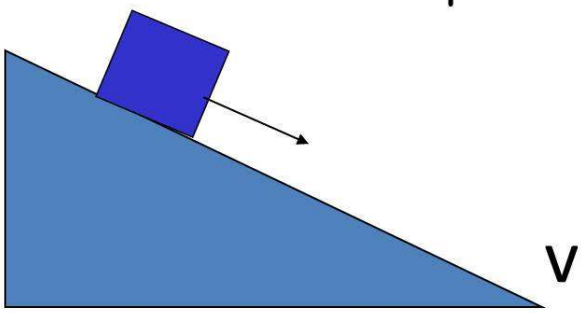


The ball rolls up the ramp, then back down. Which is the correct acceleration graph?





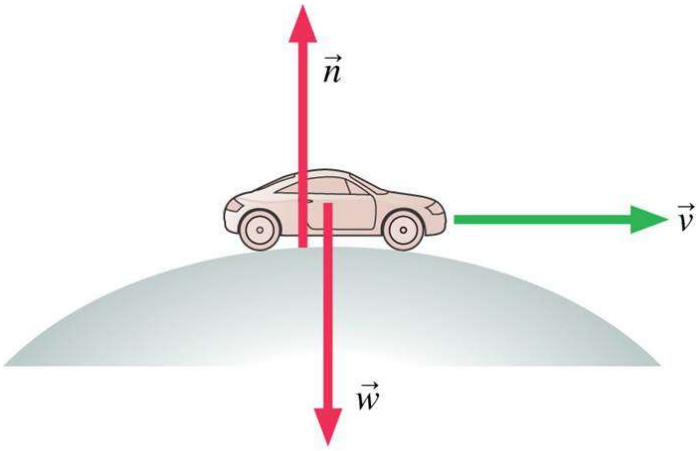
A block initially at rest is allowed to slide down a frictionless ramp and attains a speed v at the bottom.
To achieve a speed 2v at the bottom, how many times higher must the new ramp be?



Dubson/Tanner at CU Boulder

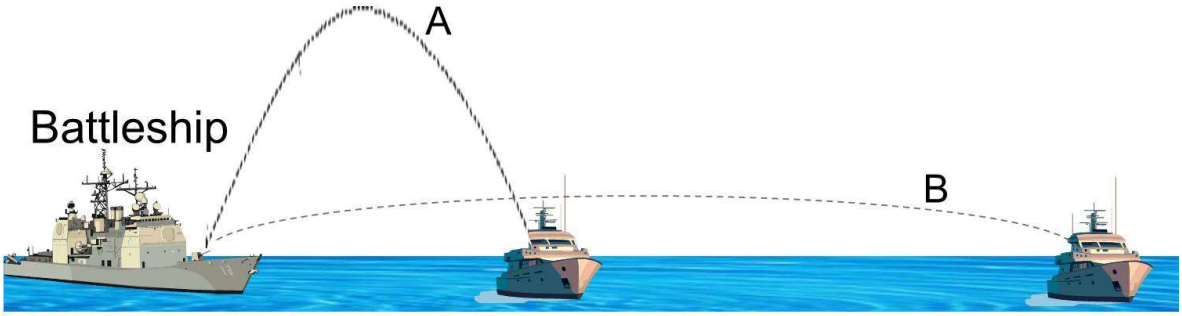
A) $\sqrt{2}$ B) 2 C) 3 D) 4 E) none of these.

A car is rolling over the top of a hill at speed v.
At this instant,



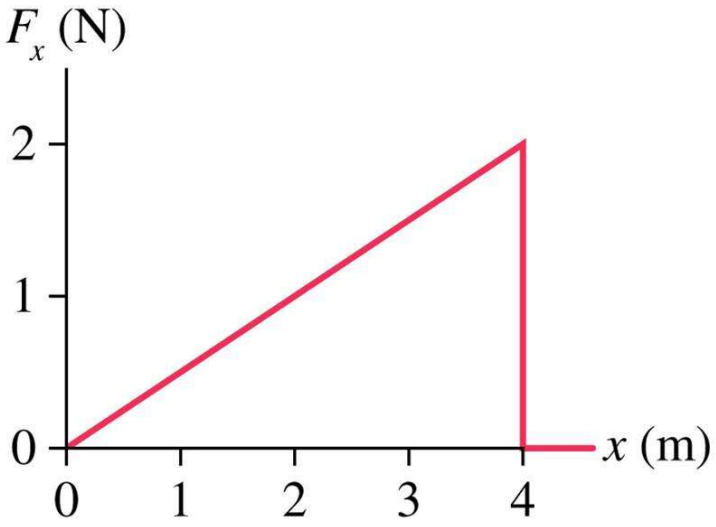
1. $n > w$.
2. $n = w$.
3. $n < w$.
4. We can't tell about n without knowing v.

A battleship simultaneously fires two shells with the **same** initial speed at enemy ships. If the shells follow the parabolic trajectories shown, which trajectory corresponds to the shell fired with a higher initial vertical velocity?



1. A
2. B
3. Both have the same initial vertical velocity.
4. Not enough info is given.

A particle moving along the x-axis experiences the force shown in the graph. If the particle has 2.0 J of kinetic energy as it passes $x = 0$ m, what is its kinetic energy when it reaches $x = 4$ m?



1) 0.0 J
2) 2.0 J
3) 4.0 J
4) 6.0 J
5) 8.0 J