Physics 121 Clicker Questions Cycle 1

Fall 2024

A ball is thrown straight up into the air. What happens at the highest point?

A The velocity and acceleration are zero.

B The velocity is non–zero but the accleration is zero.

C The acceleration is non–zero but the velocity is zero.

D Neither the velocity nor the acceleration are zero.

E Einstein himself coudn't tell you.

A ball is thrown straight up into the air. What happens at the highest point?

$a = -g$

A The velocity and acceleration are zero.

B The velocity is non–zero but the accleration is zero.

C **The acceleration is non–zero but the velocity is zero.**

D Neither the velocity nor the acceleration are zero.

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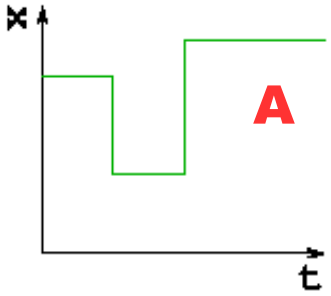
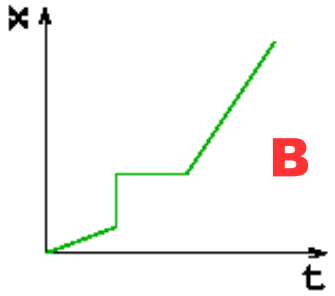
A jogger is moving down a straight road at constant velocity. He stops suddenly to tie his shoe laces, and then resumes running at a faster constant velocity.

Which of these plots shows the motion of the jogger correctly?



A



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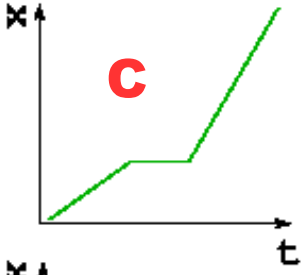
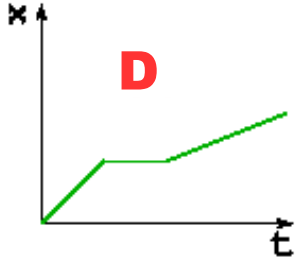
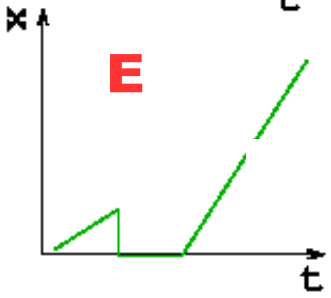


C



D



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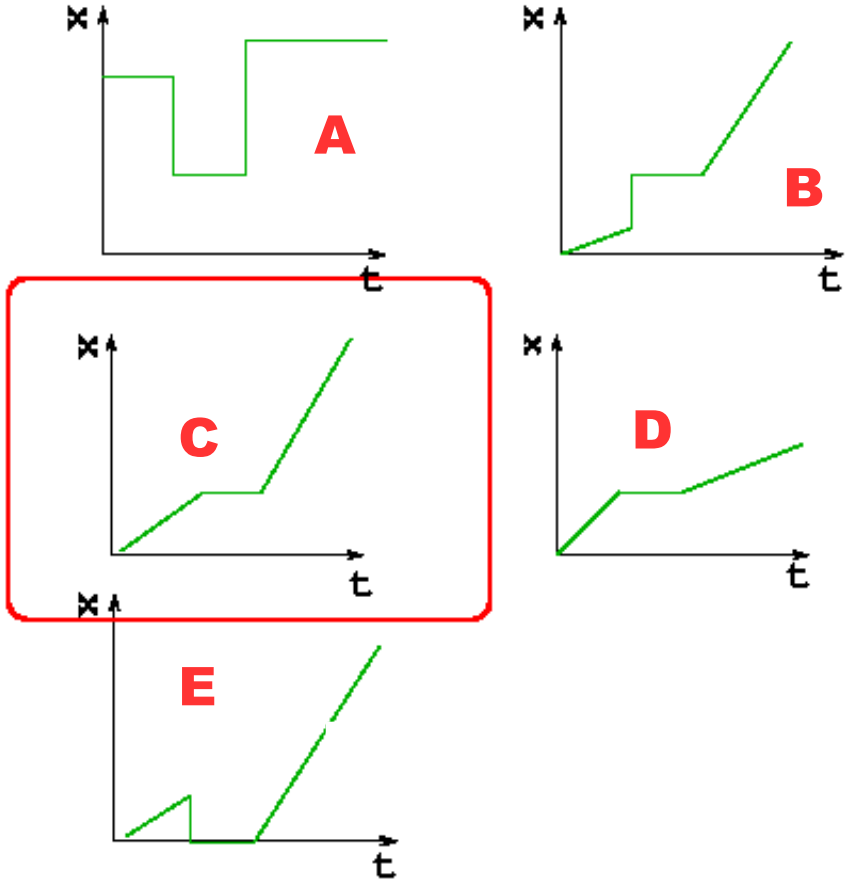
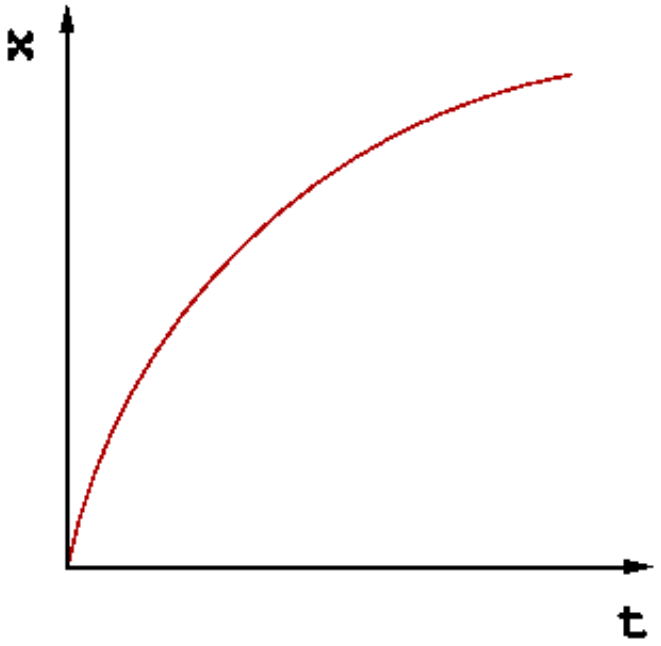


A body moves on a 1–D wordline as shown:



Which of the following are true?

A The body might be moving with constant velocity.

B The body speeds up for a while and then later slows down.

C The body is always speeding up.

D The body is always slowing down.

E None of these are true.

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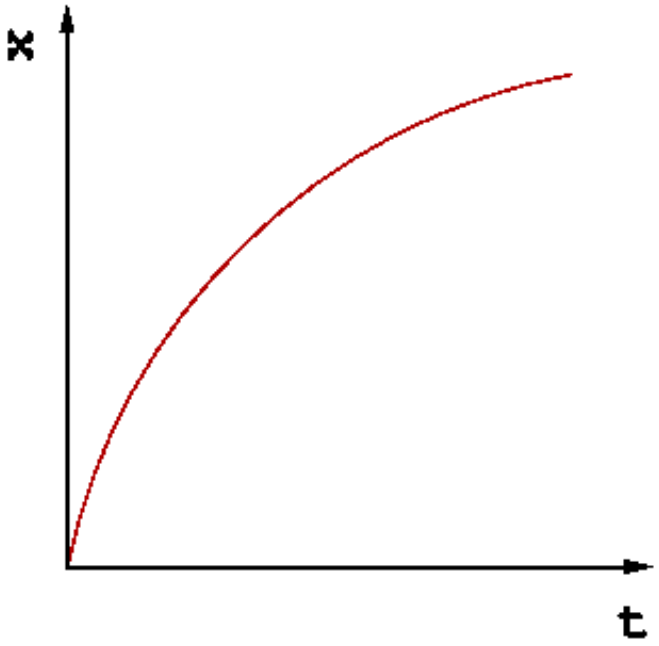

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E None of these are true.

You are inside an elevator that is moving with constant speed V upward. Your mass is m, the mass of the elevator is M and the tension on the cable is give as T.

What is the magnitude of the net force on your body that is a consequence of your motion inside the elevator?

A mg

B VT plus a constant

C exactly zero

D T–MG–mg

E Something else.

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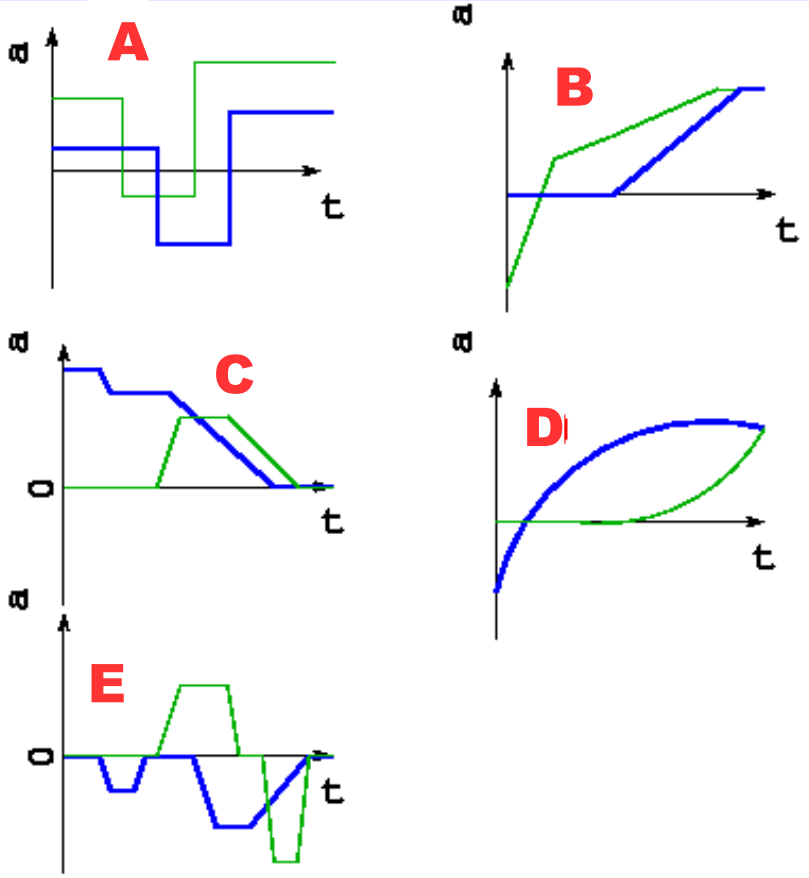
A speeder is going down the road and notices ahead of him a sitting police car. The speeder slows down but it doesn't work. The police car pulls out into the into the road and pulls the speeder over.

Which of these plots describes the acceleration of both cars during the events described?



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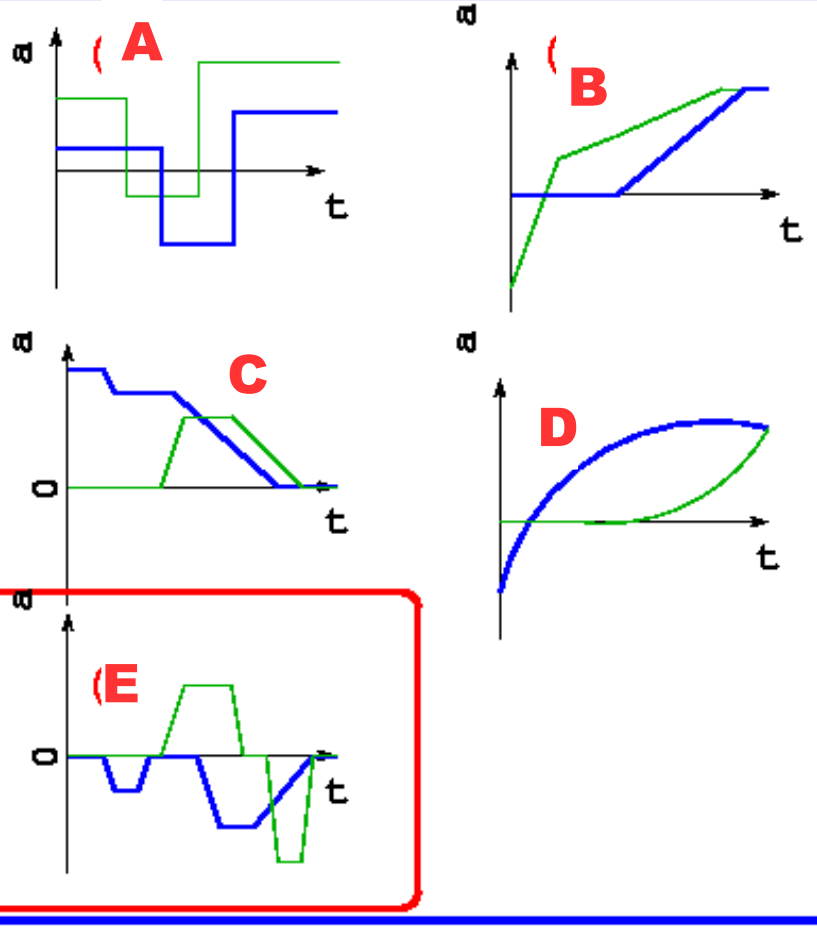
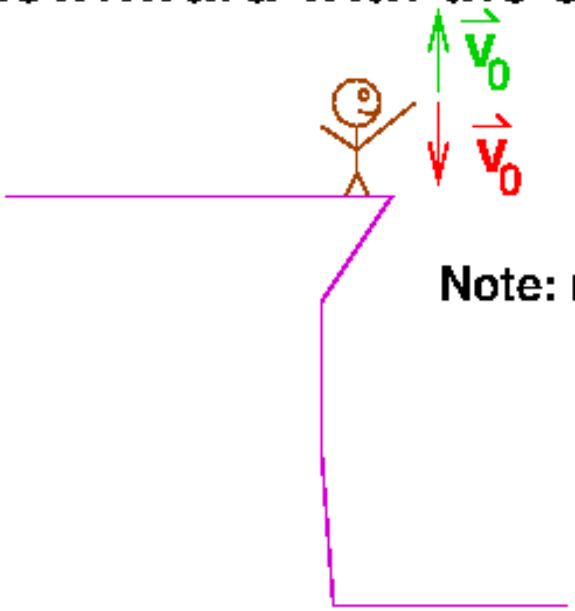


Two balls are thrown vertically from the edge of a cliff, one thrown upward with initial speed v_0 and one thrown downward with the same speed.



Note: neglect air resistance

Which ball will hit the ground at the bottom of the cliff with the greater speed on impact?

(A) The upward thrown ball.

(B) The downward thrown ball.

(C) They will hit with the same speed.

(D) We need to know more information.

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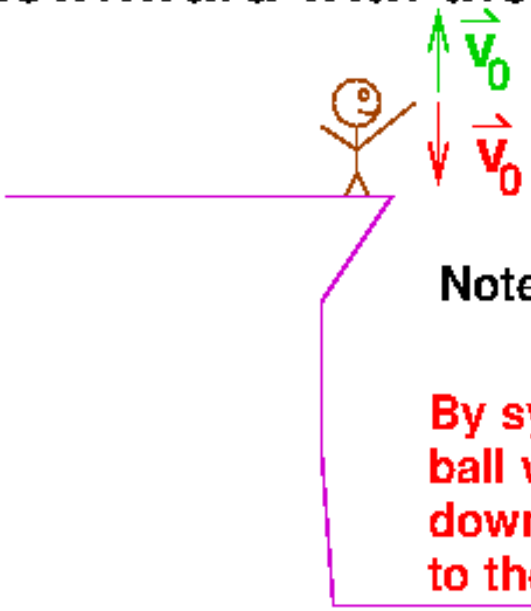

Note: neglect air resistance

By symmetry, upward–going ball will be traveling downward when it returns to the position of the hand.

Which ball will hit the ground at the bottom of the cliff with the greater speed on impact?

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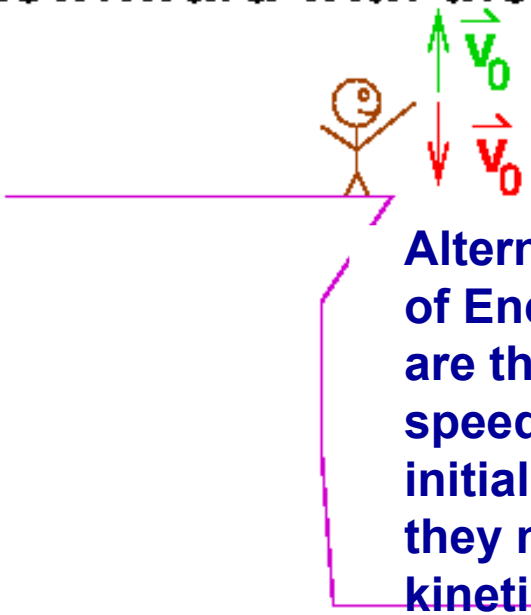

Alternatively, by Conservation of Energy, since the two balls are thrown with the same speed, they have the same initial kinetic energy and so they must have the same final kinetic energy.

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You are inside an elevator that is moving with constant accel downward. Tension T, A, masses m, M & are given (assume 0<A< g).

What is the net force that is applied to your body that results?

What is the magnitude and direction of the net force?

(A) mA downward

(B) mg downward

(C) T–(m+M)g upward

(D) m(g–A) downward

(E) None of the above.

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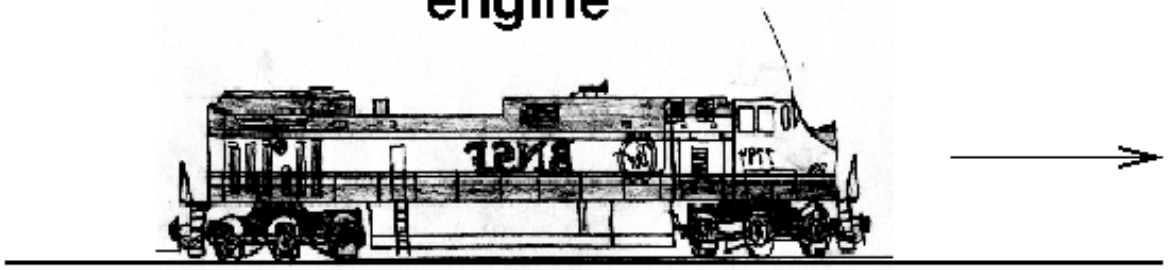
Newton's Second Law

$F_{net} = ma = mA$

engine



An engine alone is moving to the right as shown. The wheels on the engine turn without sliding or slipping on the track.

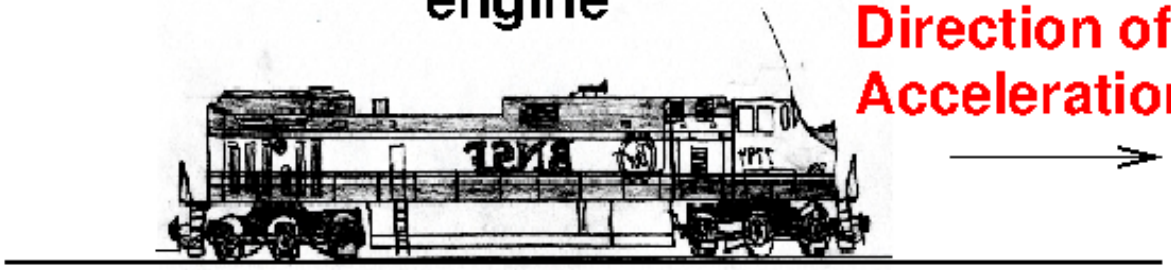
What is the direction of the force of friction applied to the engine?

(A) To the LEFT

(B) To the RIGHT

(C) There is NO FRICTION.

(D) We cannot answer this question without being given more information.



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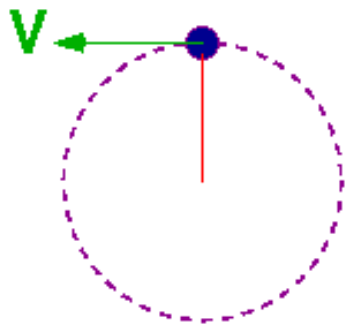
A ball is attached to a string and is swung in a vertical path so that it moves with a given speed V on a circular path with radius R. At the top of the path what is the net force on the ball?



(A) $= mV^2/R$ upward

(B $= mV^2/R$ downward

(C $= m(V^2/R - g)$ downward

(D $= m(V^2/R + g)$ downward

(E $= m(V^2/R - g)$ upward

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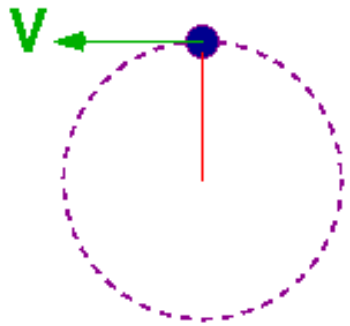

N2L:

$F_{net} = ma$

$= mV^2/R$

"centripetal" downward!

(A) $= mV^2/R$ upward

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(C) $= m(V^2/R - g)$ downward

(D) $= m(V^2/R + g)$ downward

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