

Function Relationships

Position Function

Velocity Function

Acceleration Function

$$s(t) \Rightarrow \text{take derivative} \quad s'(t) = V(t) \Rightarrow \text{take derivative} \quad s''(t) = V'(t) = a(t)$$

Position Function

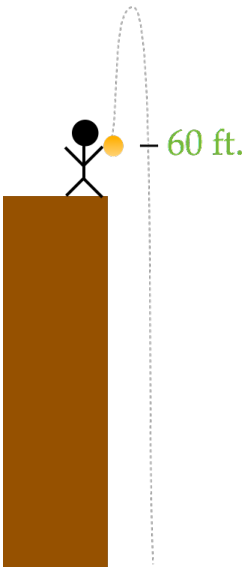
Velocity Function

Acceleration Function

$$s(t) \Leftarrow \text{find antiderivative} \quad V(t) \Leftarrow \text{find antiderivative} \quad a(t)$$

A ball is thrown upward with an initial velocity of 40 feet per second from an initial height of 60 feet. Find the position function of the ball at time t .

Constant of acceleration due to gravity = -32 ft/sec^2

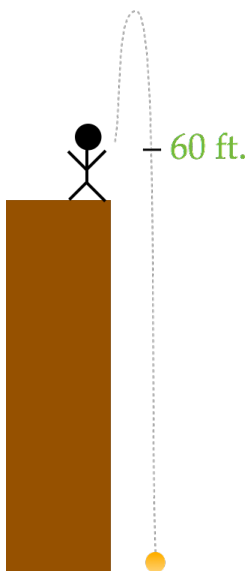


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$$a(t) = -32 \quad V(t) = -32t + 40 \quad s(t) = -16t^2 + 40t + 60$$

Find the height of the ball after 3 seconds.

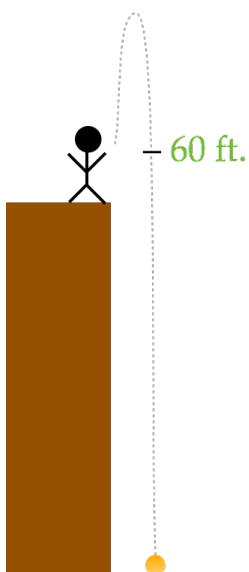


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When does the ball hit the ground?

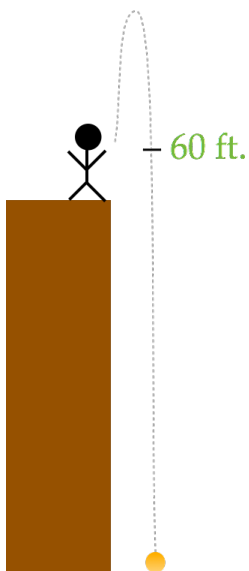


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What is the velocity of the ball when it hits the ground?

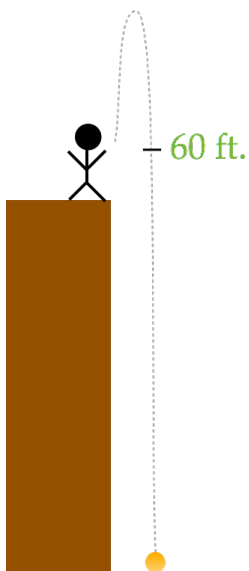


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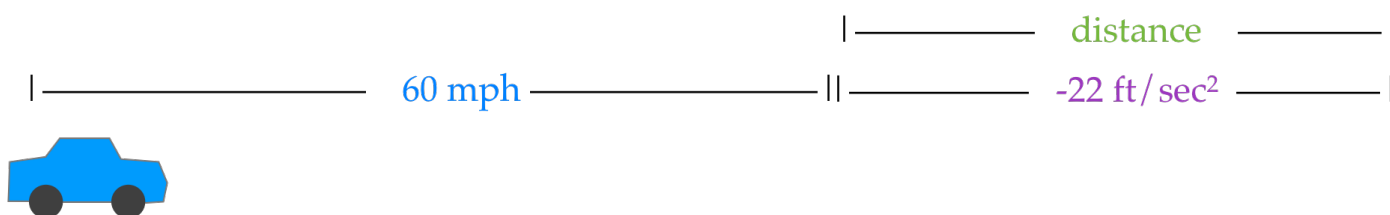
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How high does the ball go?



A car traveling 60 mph suddenly breaks, producing a deceleration of 22 ft/sec^2 .
 How far does the car travel before it comes to stop?



A car traveling 60 mph suddenly breaks, producing a deceleration of 22 ft/sec^2 .
 How far does the car travel before it comes to stop?

Constant of deceleration = -22 ft/sec^2

