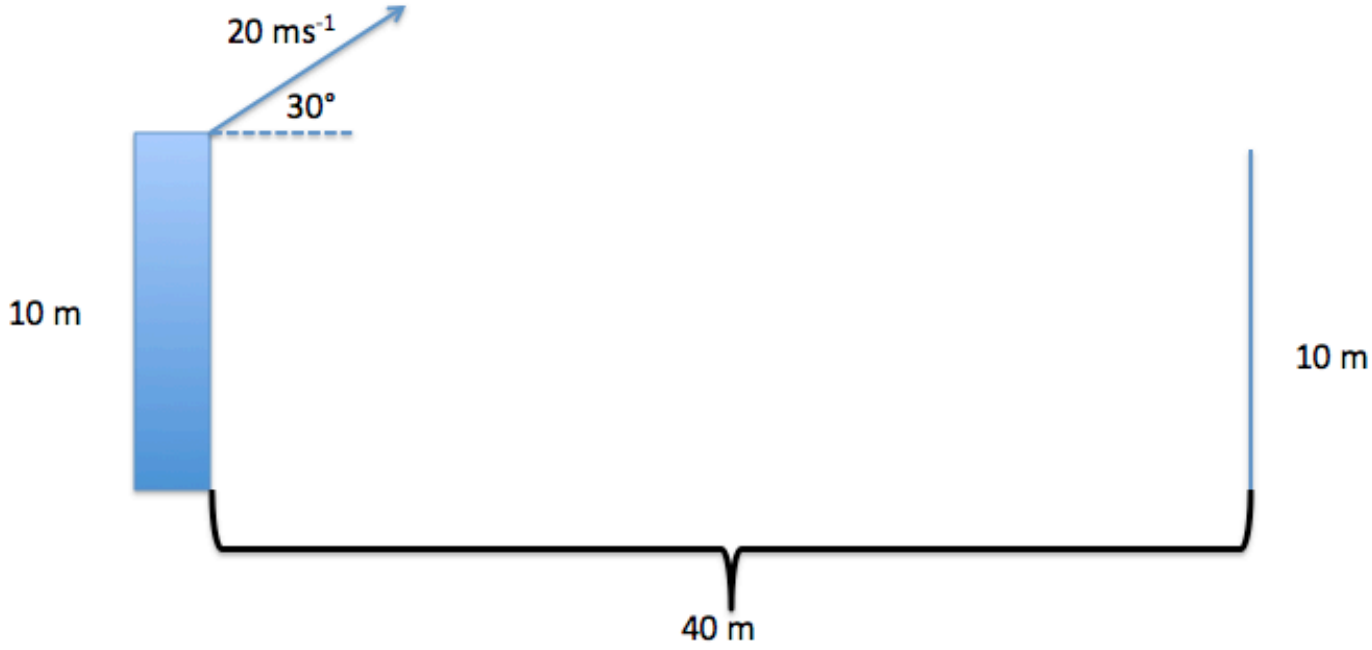
Projectile motion Challenge 1

A ball is thrown from a 10 m high cliff at the velocity 20 ms^{-1} with an angle of 30° to the horizontal plane as shown in the picture below. 40 m from the edge of the cliff is a 10 m high wall.

a) Will the ball pass over the wall?

b) If not, where will it hit the wall and with what velocity?

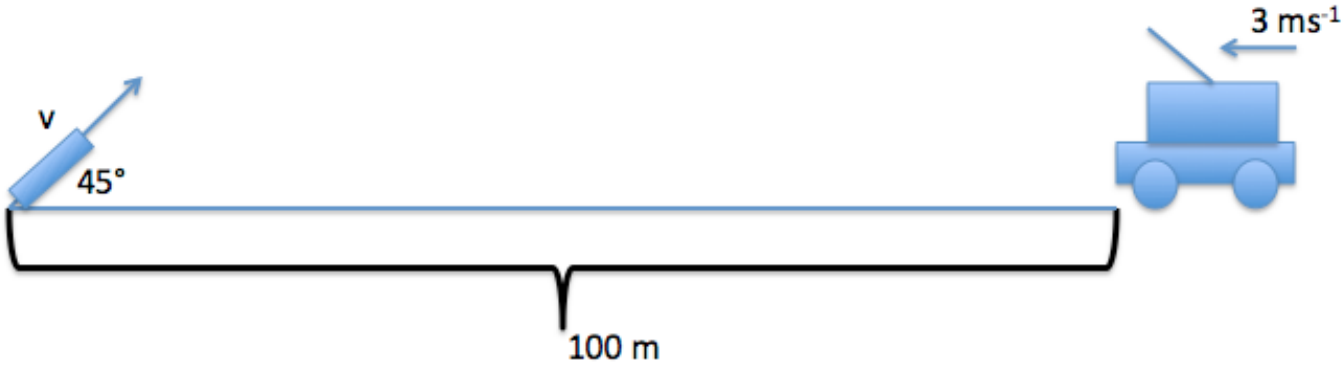


Projectile motion Challenge 2

A military car is traveling at a constant velocity of 3.00 ms^{-1} to the west. West of the car is a rocket launcher that is trying to hit the car.

The rocket is launched at a 45.0° angle to the horizontal plane when the car is 1.00 $\times 10^2$ m from the rocket. Find the initial speed that the rocket must have if it is to hit the car.

(drawing not to scale)



Projectile motion Challenge 3

A projectile is shot at a 35° angle to the horizontal from a 10.0 m high cliff.
It lands 31.4 m from the cliff.
Find the velocity at which it hits the ground.

(drawing not to scale)