A.1

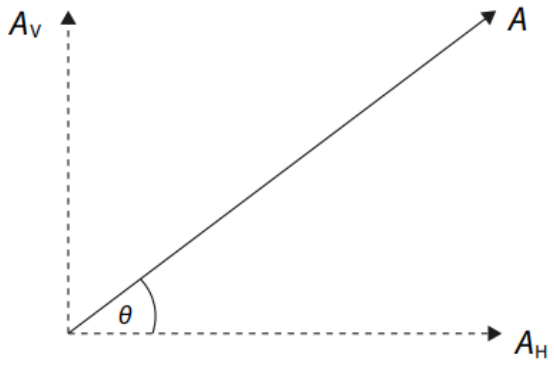
Angled Projectiles

IB PHYSICS | PROJECTILES

Data Booklet Equations

A.1

Vectors



$A_H = A\cos\theta$

$A_V = A\sin\theta$

A.1 Kinematics	$s = \frac{u+v}{2}t$ $v = u + at$ $s = ut + \frac{1}{2}at^2$ $v^2 = u^2 + 2as$

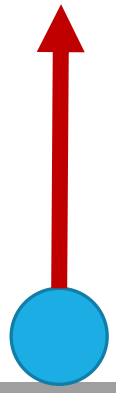
Warm Up

A.1

You launch a ball up in the air at 19.7 m/s

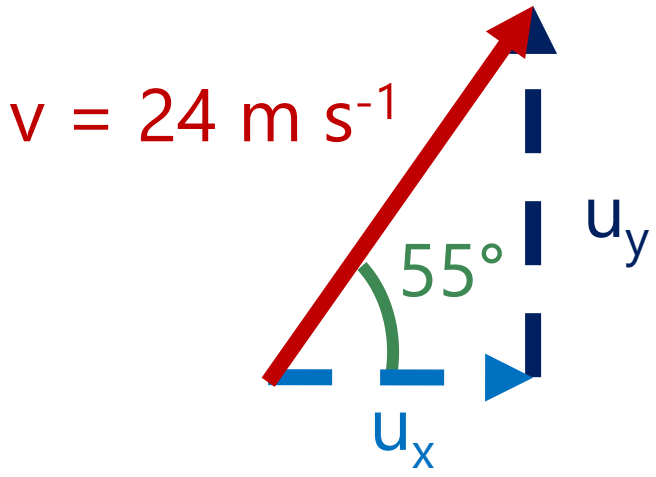
How high will it go?

How long will it be in the air?



s	
u	
v	
a	
t	

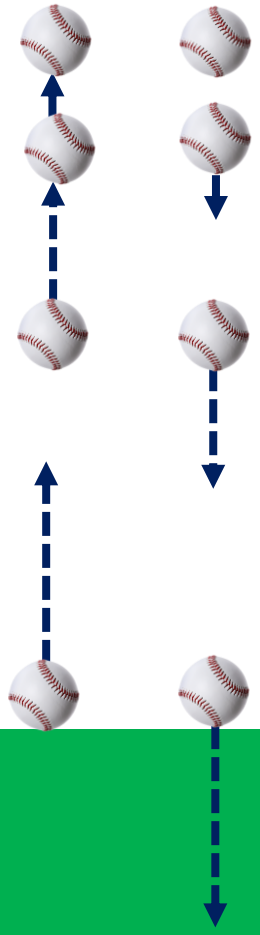
Remember Vectors?



u_x	
u_y	

One Dimensional Motion

A.1



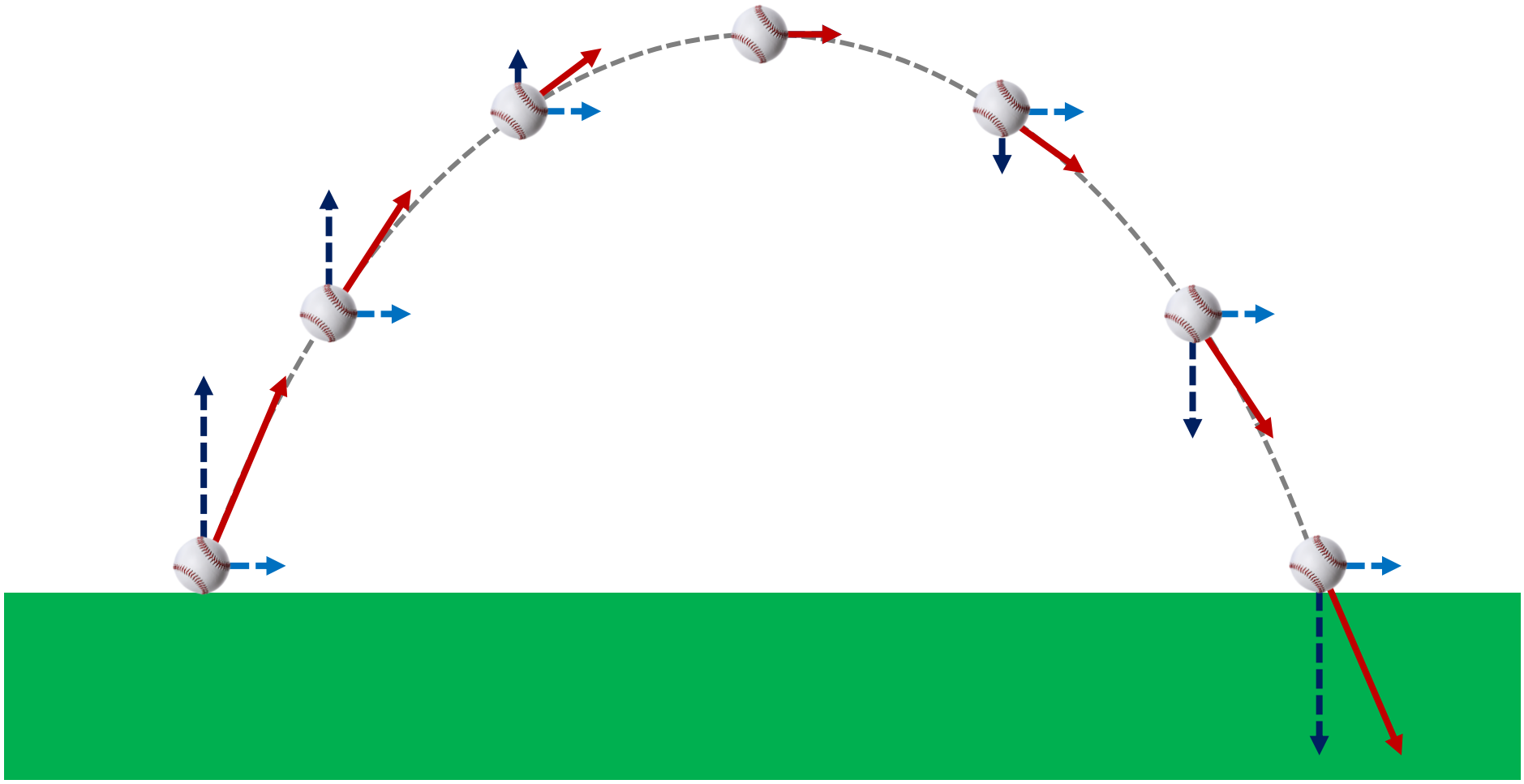
Vertical
Accelerating

Horizontal
Constant Velocity

[v = d/t]

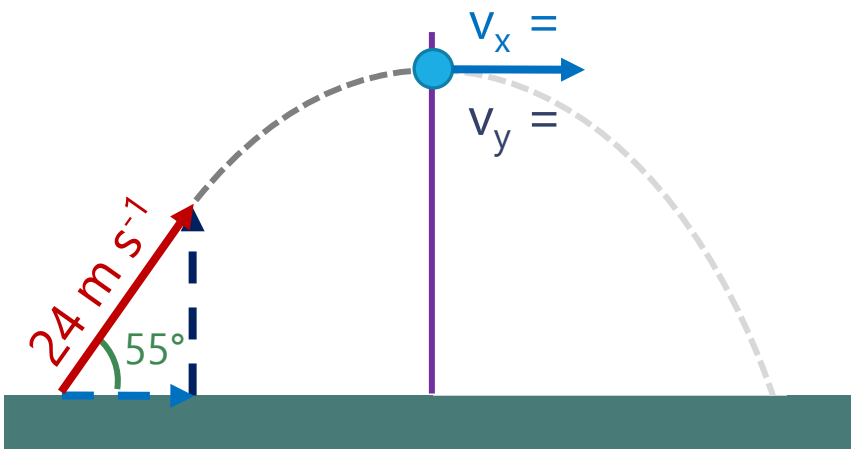
Two-Dimensional Projectile

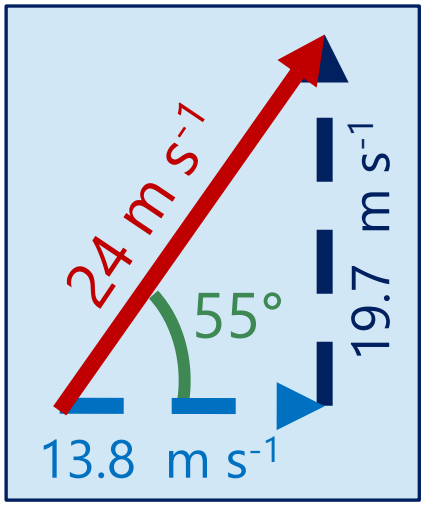
A.1



Projectile – First Half

A.1

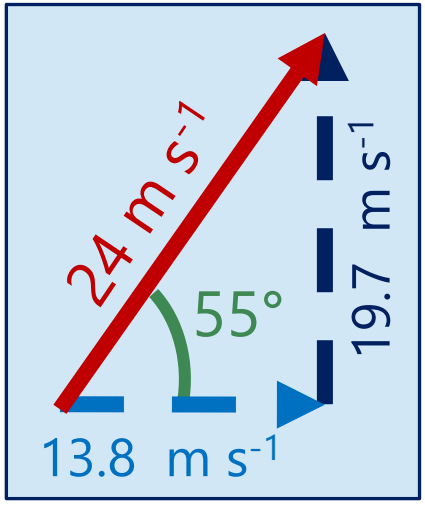




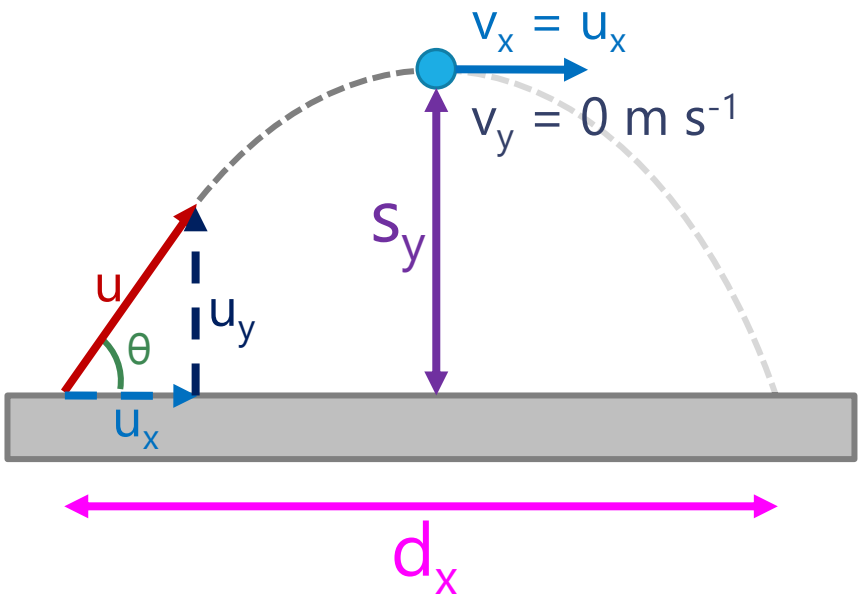
1st Half Vertical	
s	
u	
v	
a	
t	

Projectile – Full Thing

$Total\ Time$	
$Displacement_x$	



Projectile – In General

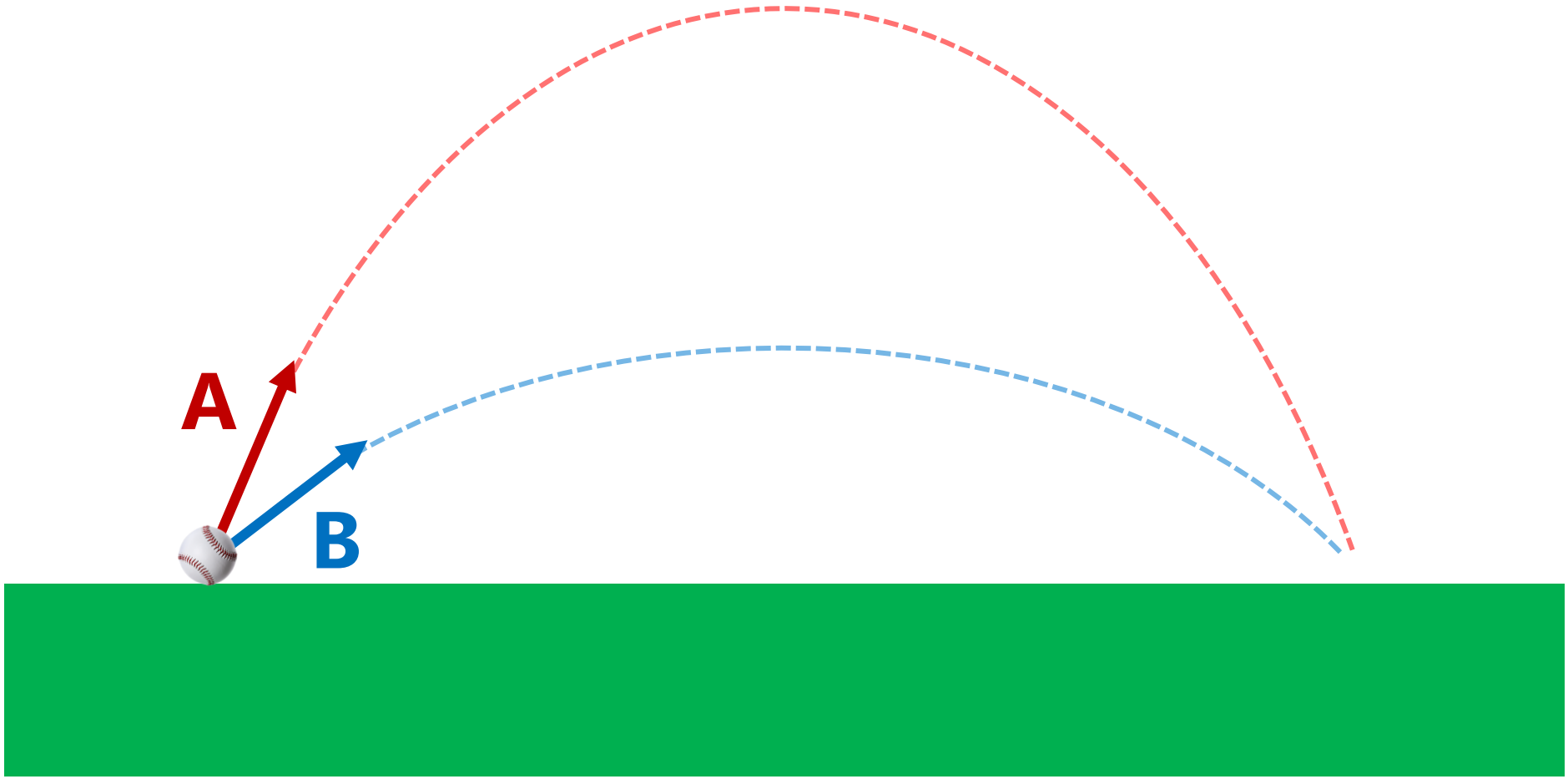


Total Time	
$Displacement_x$	

1st Half Vertical	
s	
u	
v	
a	
t	

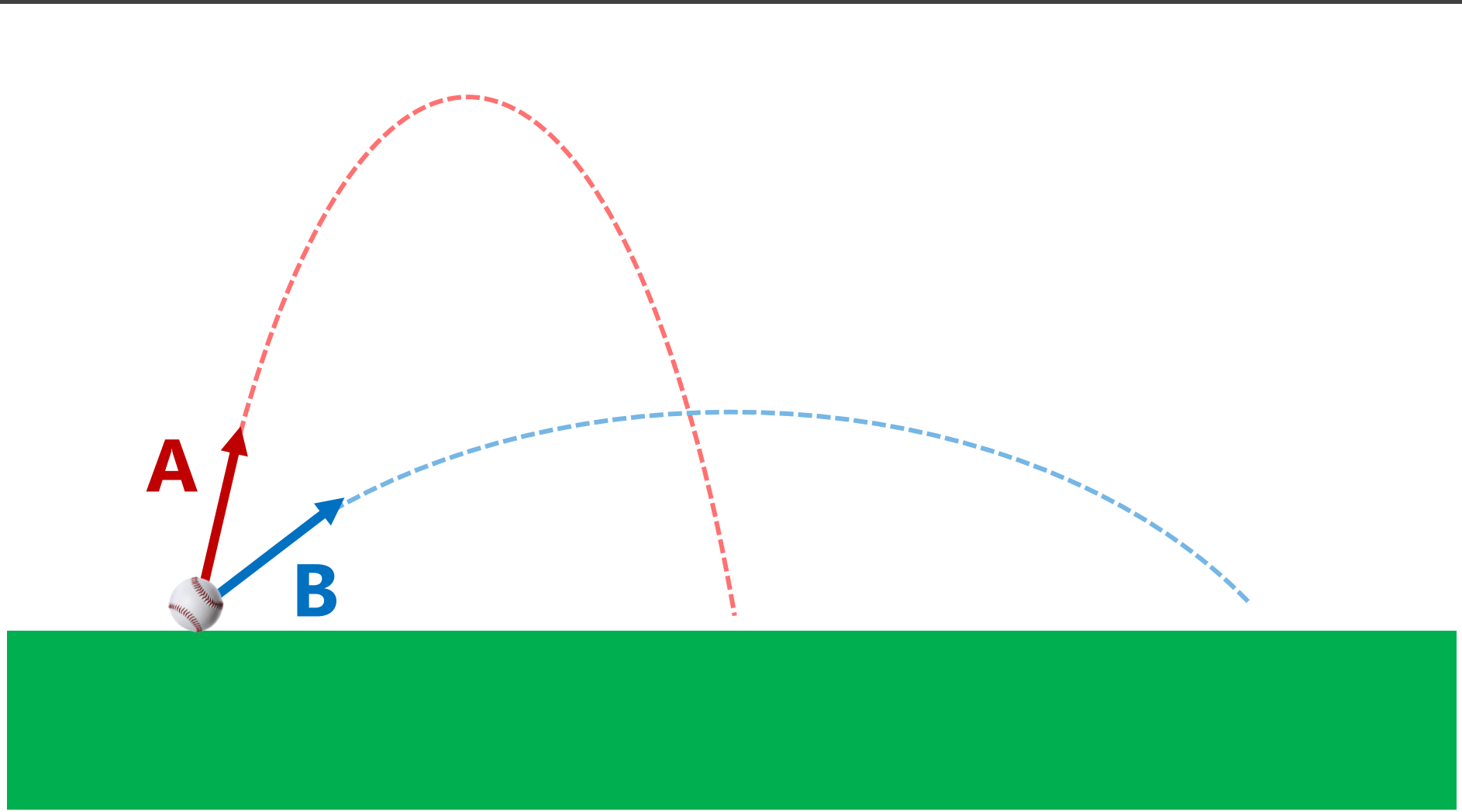
Which one lands first??

A.1



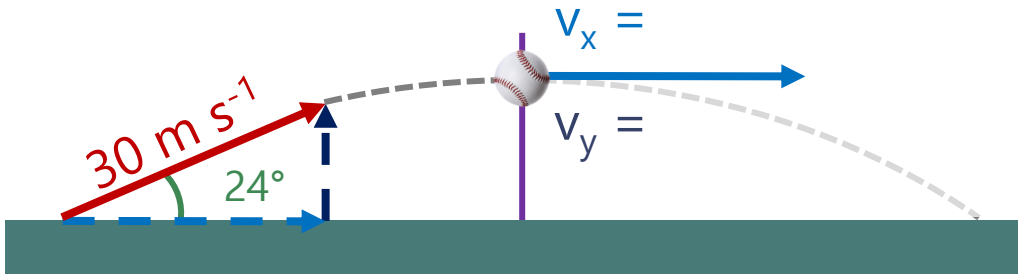
Which one lands first??

A.1



Try This…

A.1



You hit a baseball at 24° above the horizontal as a speed of 30 m s^{-1}. How far does the ball travel before it hits the ground?

1st Half Vertical	
s	
u	
v	
a	
t	

Lesson Takeaways

A.3

- ❑ I can calculate the horizontal and vertical components of an angled velocity vector
- ❑ I can calculate max height for a projectile launched at angle
- ❑ I can calculate total air-time for a projectile launched at angle
- ❑ I can calculate horizontal distance traveled for a projectile launched at angle