YAKEEN NEET 2.0

2026

Motion in a Plane

Physics | Lecture - 2

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Todays Goal

→ Revision of 1st lecture

→ H/W

→ {special case on Projectile Motion}

Join it

Class 9th PDF

Motion in a Plane [2-D motion] ⟹ [1-D] + [1-D]

x-axis Y-axis

[2-D]$_{motion}$ = 1-D motion + concept of vector

MR* → Jab bhi 2-D motion ka question ho Vector ke component method se usko Break karo, then [1-D]$_x$ & [1-D]$_y$ me seprate solve karo then Vector ke magnitude concept se final Answer likho.

MR*

x ka P.Q. sirf x ke P.Q. se solve hoga

y ka P.Q. sirf y ke P.Q. se solve hoga

MR* Box

* $a_x = 0$; $\vec{V}_x$ = Const^n uniform motion in x

* $a_y \neq 0$; $\vec{V}_y$ = varible Non-uniform in y

MR* Koin hai wo Jo dono axis ka majaa le rahai → time

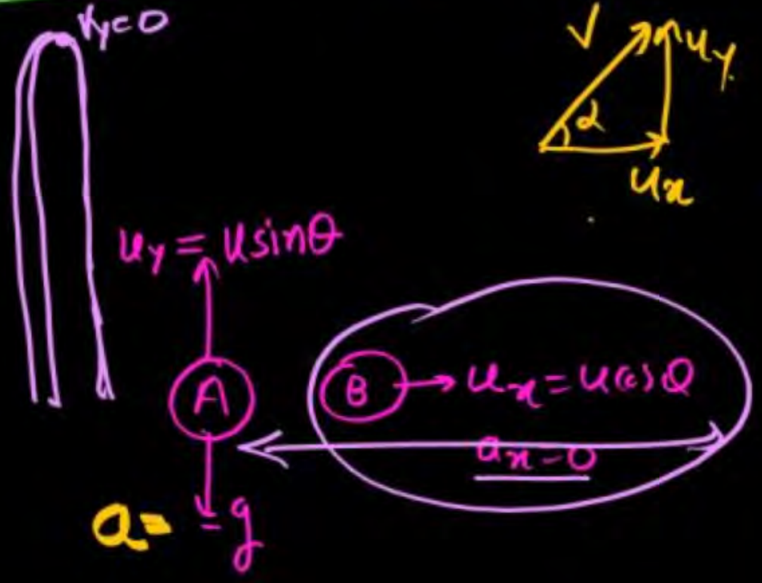
$x = 2t + 1$ — (i)

$y = 3t^2$ — (ii)

$x = 3\sin(t)$

$y = 3\cos(t)$

Projectile Motion → 2-D Non uniform motion [variable velocity] with Uniform acc^n.



P.Q.	x-axis	Y-axis	Net
initial velocity	u_x ✓	u_y ✓	$\vec{v} = u_x\hat{i} + u_y\hat{j}$ ✓
			$\lvert\vec{v}\rvert = \sqrt{u_x^2 + u_y^2}$
acc^n	$a_x = 0$ ✓	$a_y = -g\hat{j}$ ✓	$\vec{a} = -g\hat{j} = -10 m/s^2$
velocity at time	$v_t = u_x$ ✓ ↳ const	$v_y = (u_y - gt)\hat{j}$	$\vec{v} = u_x\hat{i} + (u_y - gt)\hat{j}$
disp^m	$x = u_x t$ ✓	$y = u_y t - \frac{1}{2}gt^2$ ✓	$\vec{s} = x\hat{i} + y\hat{j}$ ✓

$t = \frac{x}{u_x}$

$$T_f = \frac{2u_y}{g}$$

$$H_{max} = \frac{u_y^2}{2g}$$

$$R_{ay} = u_x T_f = u_x \frac{2u_y}{g}$$

Angle of Projection

(*) $\tan\theta = \frac{u_y}{u_x}$

(#) $y = u_y t - \frac{1}{2}gt^2 = u_y\left[\frac{x}{u_x}\right] - \frac{1}{2}g\left(\frac{x}{u_x}\right)^2$

No Ratta

$$y = \frac{u_y}{u_x}x - \frac{1}{2}g\frac{x^2}{u_x^2}$$

eq^n of Trajectory

Projectile Motion → 2-D Non uniform motion [variable velocity] with Uniform acc^{n}.

MRT Box
T_f & H_{max} Same as Motion under gravity.

$$\# \left[T(\text{Time of flight}) = \frac{2u_y}{g} = \frac{2u\sin\theta}{g} \right]$$ consider motion in y-axis.

$$\# \boxed{H_{max} = \frac{u_y^2}{2g}} = \frac{(u\sin\theta)^2}{2g} = \frac{u^2\sin^2\theta}{2g}$$

$$\# \boxed{R = u_x t_f} = u_x \frac{2u_y}{g}$$ } consider in x-axis

$$\boxed{R = \frac{2u_x u_y}{g}}$$

(#) Velocity at max^{m} hight $= u_x$

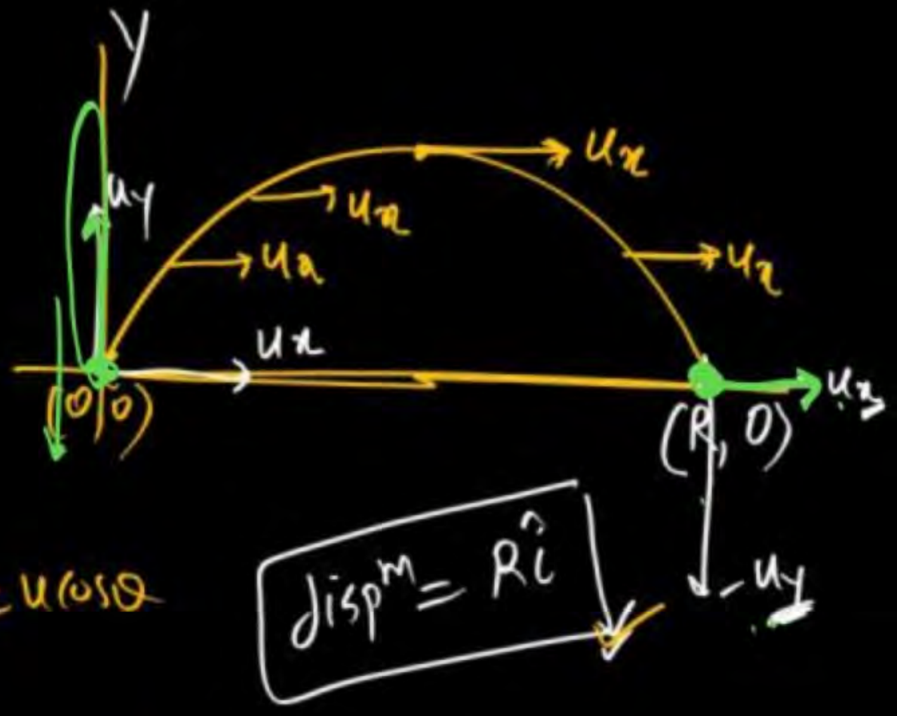
(#) Velocity of collsion $= u_x\hat{i} - u_y\hat{j}$

(#)(#) Change in velocity $= \vec{v}_f - \vec{v}_i$

$= (u_x\hat{i} - u_y\hat{j}) - [u_x\hat{i} + u_y\hat{j}]$

$= u_x\hat{i} - u_y\hat{j} - u_x\hat{i} - u_y\hat{j}$

(+) Change in velocity $= -2u_y\hat{j}$



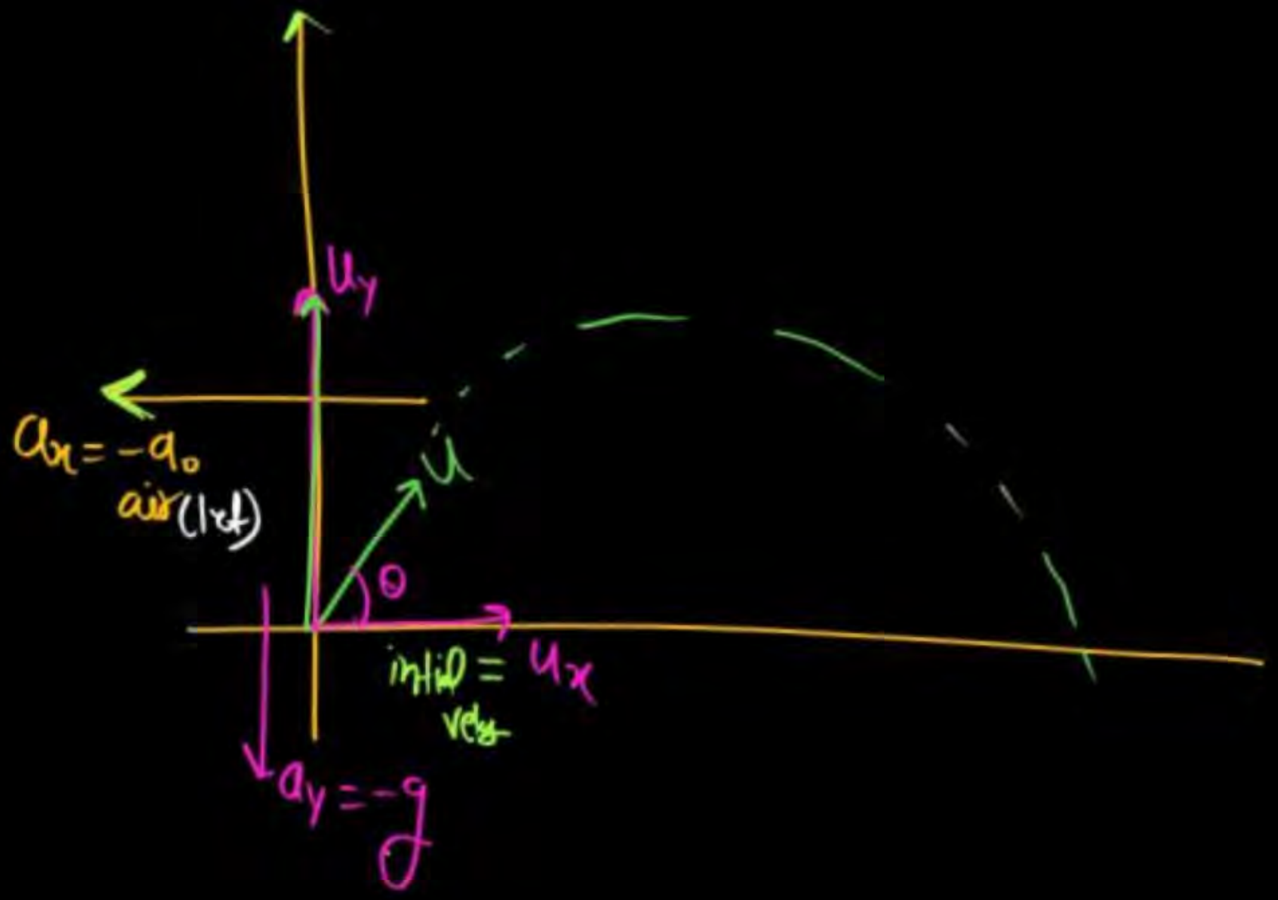
(#) Avg velocity $= \dfrac{\text{Total disp}^m}{\text{time}} = \dfrac{R}{T_f} = \dfrac{u_x T_f}{T_f} = u_x = u\cos\theta$

$\text{disp}^m = R\hat{i}$

(#) Avg velocity $= \dfrac{\vec{u}_i + \vec{v}_f}{2} = \dfrac{u_x\hat{i} + u_y\hat{j} + u_x\hat{i} - u_y\hat{j}}{2} = \dfrac{2u_x\hat{i}}{2} = u_x\hat{i}$

(#) If air resistance consider in x-axis only (air resistance opposite to motion)

then what will be effect of H_m | T_f | R.



$$T_f = \frac{2u_y}{g_{y\text{-axis}}} \longrightarrow \text{same}$$

$$H_m = \frac{u_y^2}{2g} \rightarrow \text{same}$$

$$R = u_x T_f \times$$

$$R = u_x T_f - \frac{1}{2} a_0 T_f^2$$ decrease

Important

Rel^n b/w H_{max} & R.

(#) $$\frac{H_{max}}{R} = \frac{u_y^2}{2g \cdot u_x \cdot \frac{2u_y}{g}}$$

$$\frac{H}{R} = \frac{u_y}{4u_x}$$

$$\tan\theta = \frac{u_y}{u_x}$$

$$\frac{H}{R} = \frac{\tan\theta}{4}$$

$$H = \frac{R\tan\theta}{4}$$

$$\text{Range} = u_x T_f$$

(#)

(Q) If H_{max} is equal to Range then find Angle of Projection

NEET-2014

Sol^n $H = \frac{R\tan\theta}{4}$

$\tan\theta = 4$

$\theta = \tan^{-1}(4)$

Object is Projected with $\vec{u} = u_x\hat{i} + u_y\hat{j}$ then find t after which it is moving $\perp^r$ to initial velocity ✓

Soln $\quad \vec{u}_{t=0} = u_x\hat{i} + u_y\hat{j}$

$$\vec{v} = u_x\hat{i} + (u_y - gt)\hat{j}$$

When Two P.Q is $\perp^r$ then their dot Product will be zero.

$$\vec{u} \cdot \vec{v} = 0$$

$$u_x^2 + u_y^2 - u_y gt = 0$$

$$u_x^2 + u_y^2 = u_y gt$$

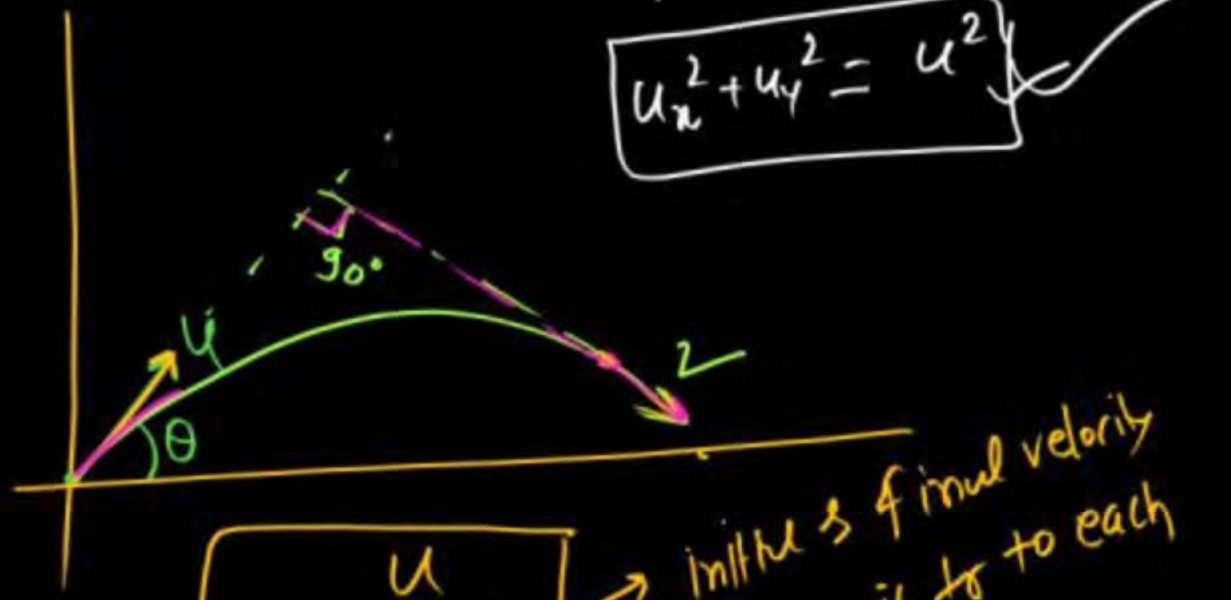
$$u\,u_x = u\sin\theta\, gt$$

$$t = \frac{u}{g\sin\theta}$$

$u_x = u\cos\theta$

$u_y = u\sin\theta$

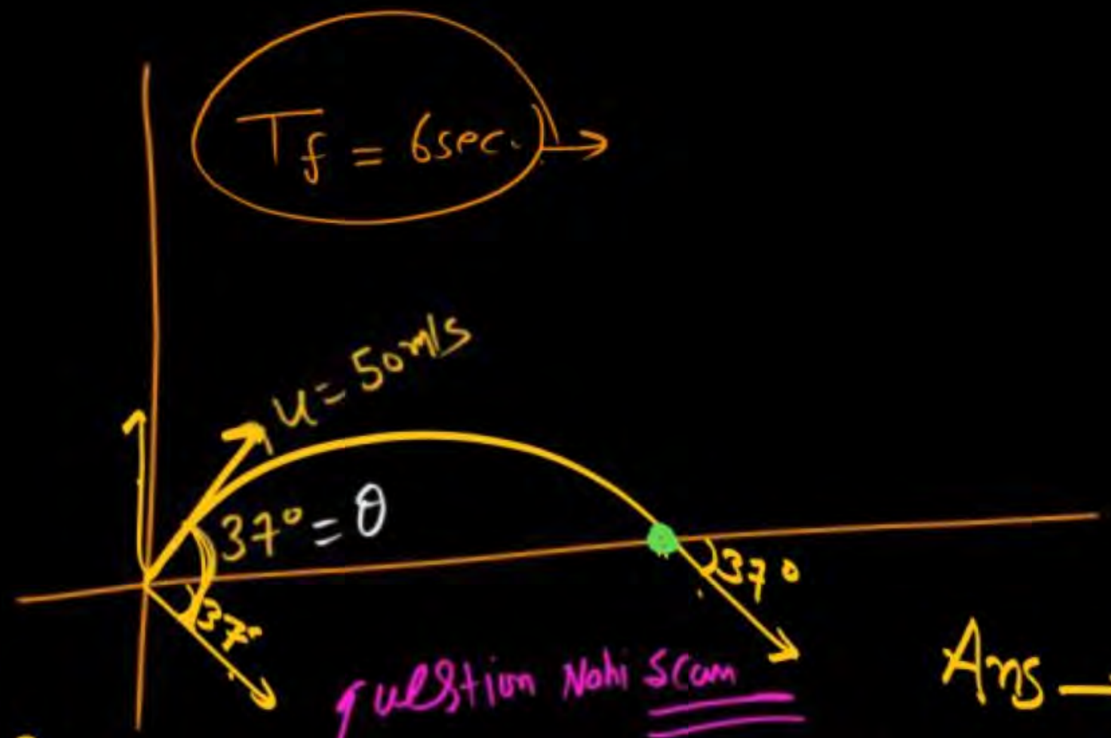
$$u_x^2 + u_y^2 = u^2$$



$$t = \frac{u}{g\sin\theta}$$

→ initial & final velocity is $\perp^r$ to each other

Find time when final velocity is $\frac{1}{2}$ to intial velocity.



$$t = \frac{u}{g \sin\theta}$$

$$= \frac{50}{10 \times \frac{3}{5}}$$

$$= \frac{25}{3} = 8.1 sec$$

Question Nahi Scam

Why ??

Ans → Not Possible

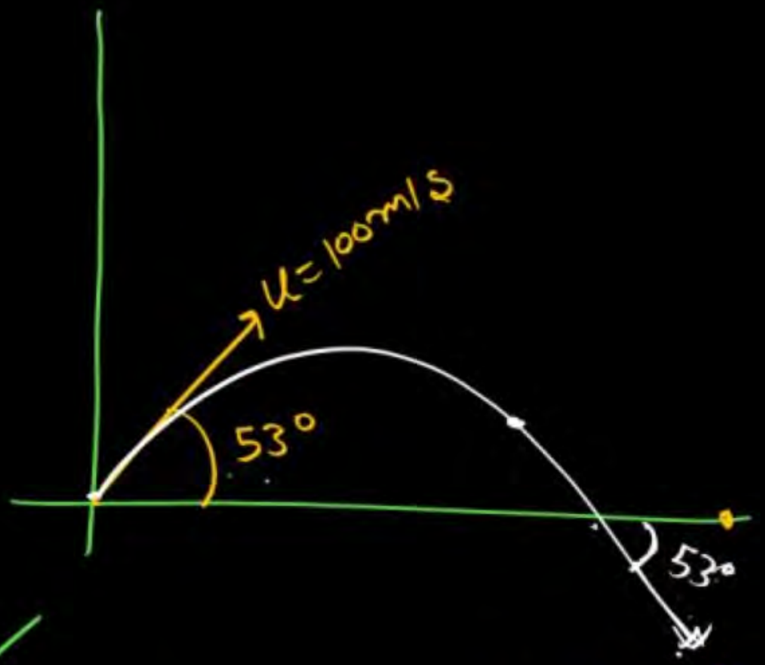
$$T_f = \frac{2u_y}{g} = \frac{2 \times 4 \sin 37°}{10} = \frac{2 \times 5 \times 3}{10 \times 5} = 6sec$$

total Ang.

$\theta = 37$

$\times 2$

$74°$



If Ball is projected less than 45° then its velocity never becomes 1/2 to initial velocity.

✓ find time when velocity of object becomes 1/2 to initial velocity

$$t = \frac{u}{g\sin\theta} = \frac{10\cancel{0}}{\cancel{10} \times \sin 53^\circ}$$

$$= \frac{10 \times 5}{4} = \frac{50}{4}\ \text{sec.} = 12.5\ \text{sec. Answer}$$

∴

⊙ time of flight

$$T_f = \frac{2u\sin\theta}{g}$$

$$= \frac{2 \times 10\cancel{0} \times 4}{\cancel{8} \times \cancel{10}}$$

$$= 16\ \text{sec Ans}$$

Question

A particle moving with velocity $\vec{V} = y\,\hat{i} + x\,\hat{j}$ then find equation of trajectory.

[IIT-2020]

$$v_y = x \Rightarrow \frac{dy}{dt} = x \quad -(i)$$

$$v_x = y \rightarrow \frac{dx}{dt} = y \quad -(ii)$$

$$\frac{dy}{dx} = \frac{x}{y}$$

$$\int y\,dy = \int x\,dx$$

$$\frac{y^2}{2} + c_1 = \frac{x^2}{2} + c_2 \longrightarrow \frac{y^2}{2} - \frac{x^2}{2} = c_2 - c_1$$

$$y^2 - x^2 = 2(c_2 - c_1)$$

$$\boxed{y^2 - x^2 = c}$$ Ans

$$\frac{y^2}{2} = \frac{x^2}{2}$$

$$\boxed{y = x}$$ wrong

Question लिखना नहीं

A bullet is fired from a gun at the speed of $280\ ms^{-1}$ in the direction $30°$ above the horizontal. The maximum height attained by the bullet is _____.

($g = 9.8\ ms^{-2}$, $\sin 30° = 0.5$) **[NEET-2023]**

1. 80 m
2. 100 m
3. 60 m
4. 40 m

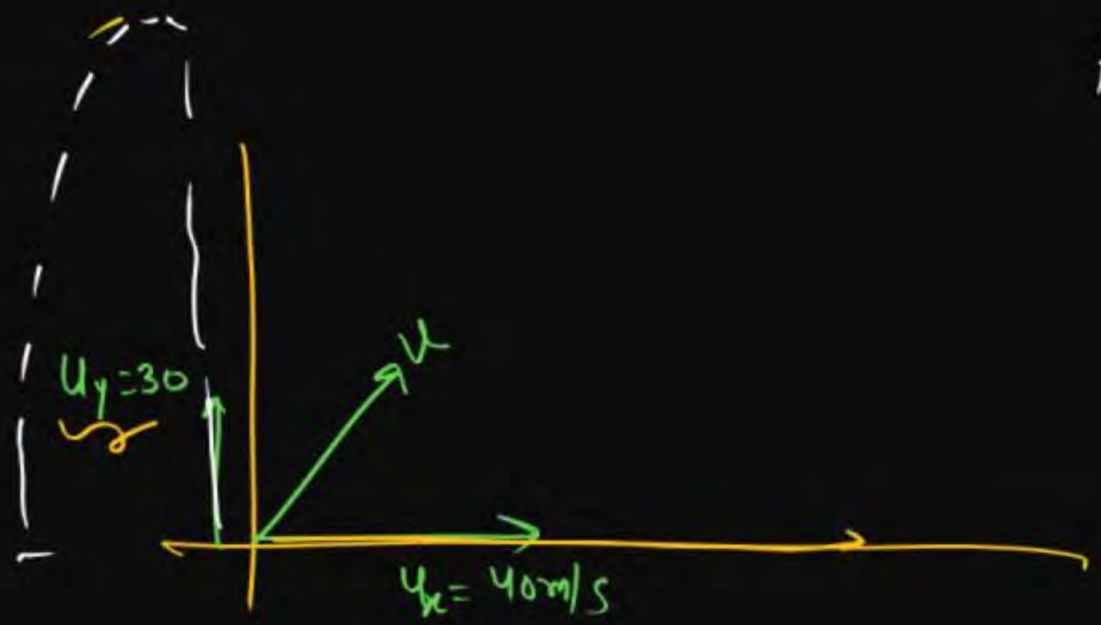
$$H_{max} = \frac{u_y^2}{2g} = \frac{u^2 \sin^2\theta}{2g} = \frac{280 \times 280 \times \left(\frac{1}{2}\right)^2}{2 \times 10}$$

$$= \frac{140 \times 14 \times 7}{4} = 140 \times 7 =$$

$$= 980\ m \simeq 1000\ m$$

Question

Velocity of projection $\vec{u} = 40\hat{i} + 30\hat{j}$ then find H, T, R and angle of projection.



$$H_{max} = \frac{u_y^2}{2g} = \frac{(30)^2}{2\times 10}$$

$$= \frac{15}{\cancel{30}\times 3\cancel{0}} = \frac{}{\cancel{2}\times 1\cancel{0}}$$

$$= 45m$$

$T_f = 3+3 = 6 sec$

$R = u_x T_f$

$= 40 \times 6$

$= 240m$

$$\tan\theta = \frac{u_y}{u_x} = \frac{3\cancel{0}}{4\cancel{0}}$$

$\tan\theta = 3/4$

$\theta = 37°$

Question

The horizontal range and the maximum height of a projectile are equal. The angle of projection of the projectile is: [AIPMT Pre. 2012]

1. $\theta = \tan^{-1}$
2. $\theta = 45°$
3. $\theta = \tan^{-1}\left(\frac{1}{4}\right)$
4. $\theta = \tan^{-1}(4)$

Question

The horizontal range of a projectile is $4\sqrt{3}$ times its maximum height. Its angle of projectile will be:

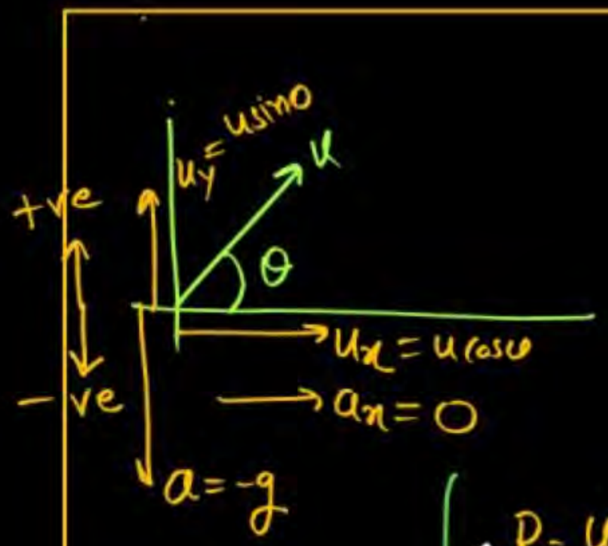
1. $45°$
2. $60°$
3. $90°$
4. $30°$

$R = 4\sqrt{3}H$

$H = \frac{R\tan\theta}{4}$

$H = \frac{4\sqrt{3}H\tan\theta}{4}$

$\tan\theta = \frac{1}{\sqrt{3}}$



$$\tan\theta = \frac{u_y}{u_x}$$

$$H = \frac{R\tan\theta}{4}$$

$$t = \frac{u}{g\sin\theta}$$

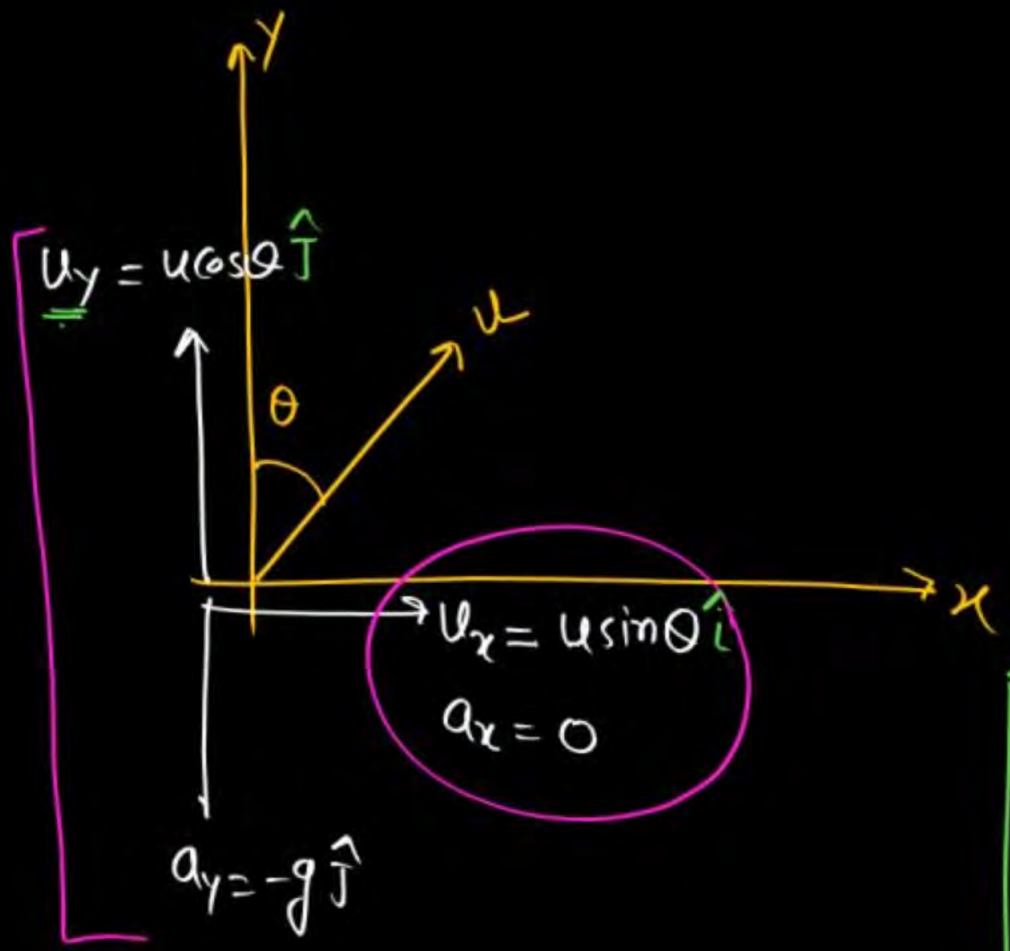
time for $\vec{v} \perp$ or $\vec{u}$ if $\theta \geq 45^\circ$

- $T_f = \frac{2u_y}{g}$
- $H_{max} = \frac{u_y 2}{2g}$

- $R = u_x T_f$
  $= \frac{2u_y u_x}{g}$
  $= \frac{u^2 \sin(2\theta)}{g}$

Start Karte

(Q) Ball is projected with speed u at an angle θ from vertical then find H_{max}, T_f, Range., velocity at t' (likha hai) NEET-2022



$$T_f = \frac{2u_y}{g} \longrightarrow T_f = \frac{2u\cos\theta}{g}$$

$$H_{max} = \frac{u_y^2}{2g} \longrightarrow H_{max} = \frac{u^2\cos^2\theta}{2g}$$

$$R = u_x T_f \longrightarrow R = u_x\left[\frac{2u_y}{g}\right]$$ ✓

$$\vec{V}_t = \vec{u}_x\hat{i} + (u_y - gt)\hat{j}$$

$$= u\sin\theta\,\hat{i} + (u\cos\theta - gt)\hat{j}$$

Integral

find given P.Q.

① $T_f = \frac{2u_y}{g} = \frac{2\times 40}{10} = 8\,sec$

② $H_{max} = \frac{u_y^2}{2g} = \frac{40\times 40}{2\times 10} = 80m$ ✓

③ $R = u_x T_f = 30 \times 8 = 240m$

④ velocity at $t = 4sec$

$$\vec{V} = 30\hat{i} + (40 - 10\times 4)\hat{j}$$

$$\boxed{V = 30\hat{i}}$$

⑤ Position at $t = 2sec$

$x = 30\times 2 = 60m\,\hat{i}$

$y = u_y t - \frac{1}{2}gt^2$

$= 40\times 2 - \frac{1}{2}10(2)^2$

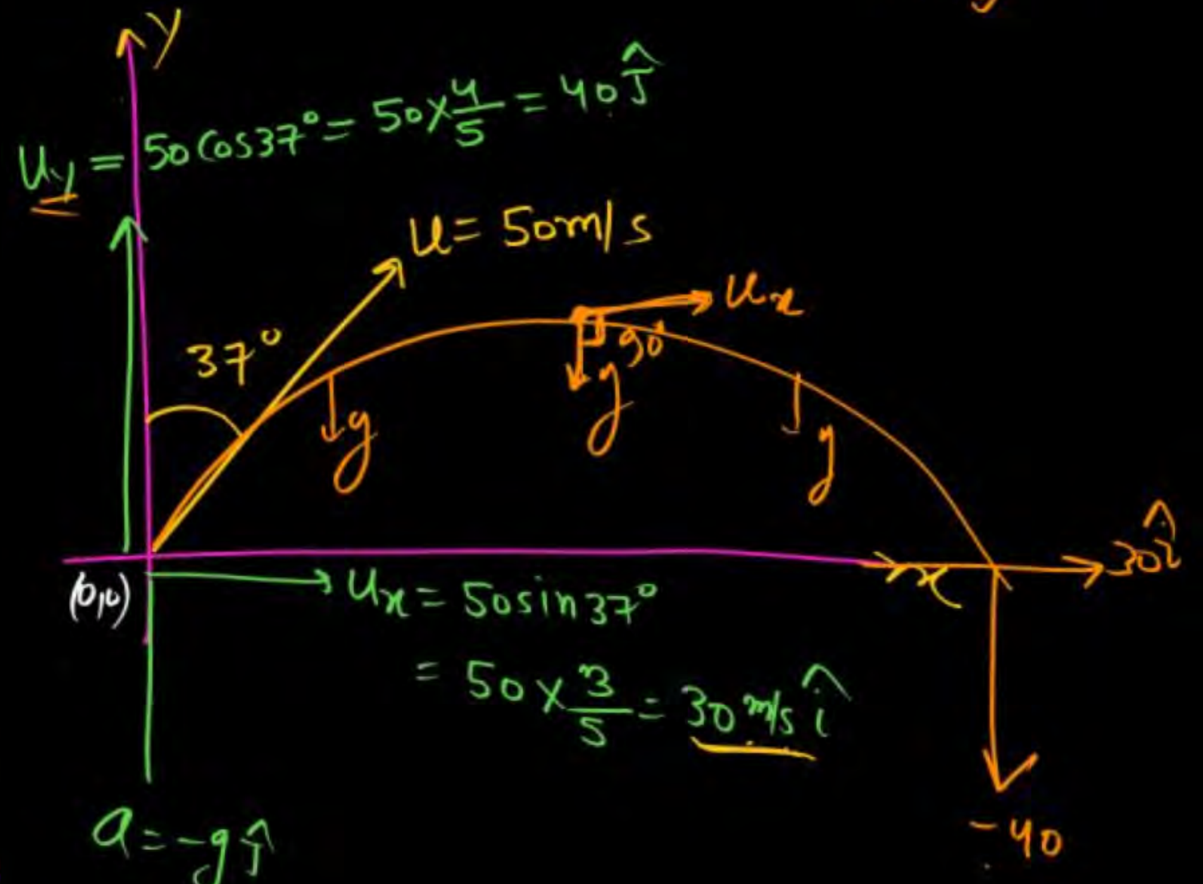
$= 80 - 20$

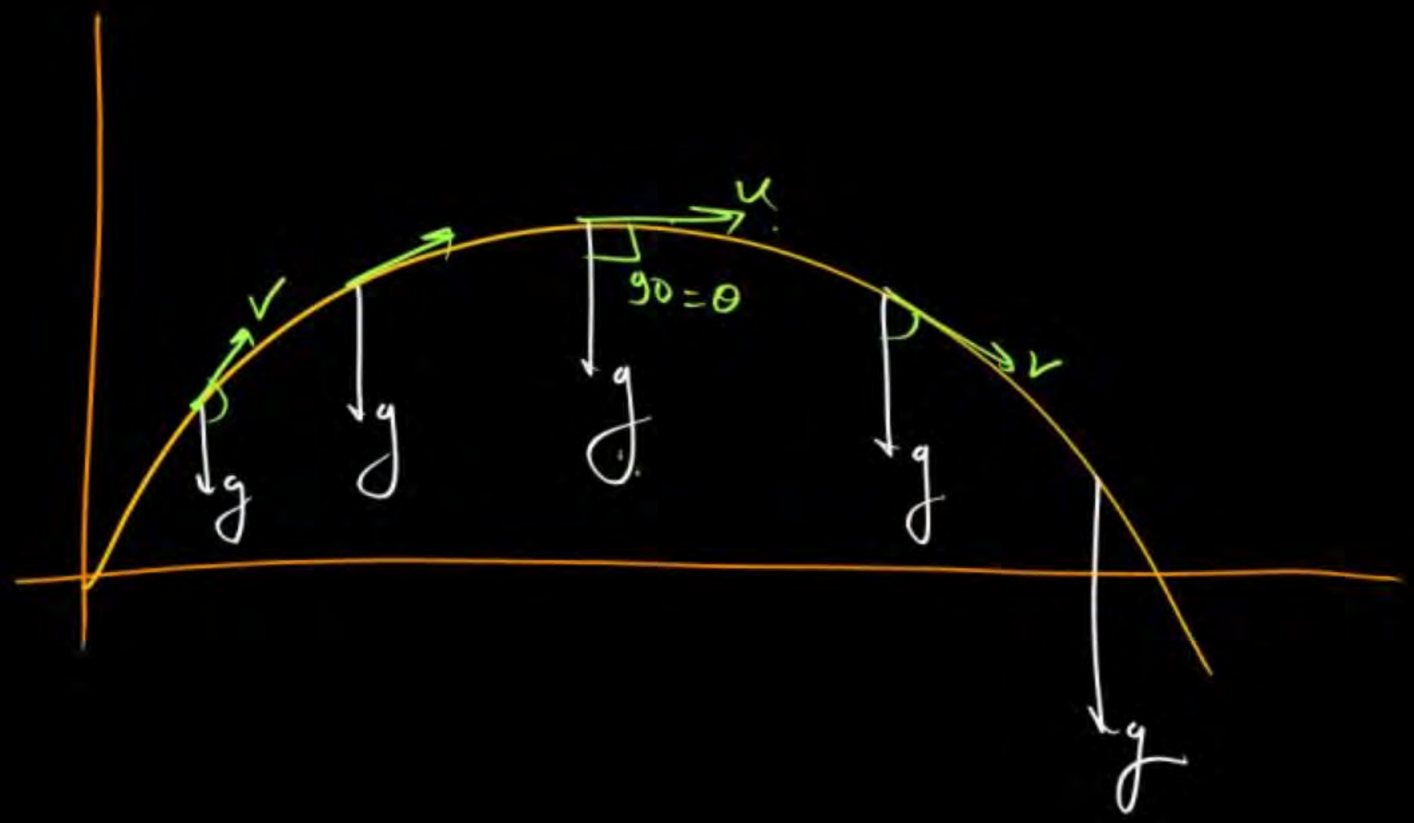
$= 60\hat{j}$

⑥ acc^n at 6sec

$a = -g\hat{j}$

⑦ At max^m Height velocity & acc^n will be ⊥r ✓

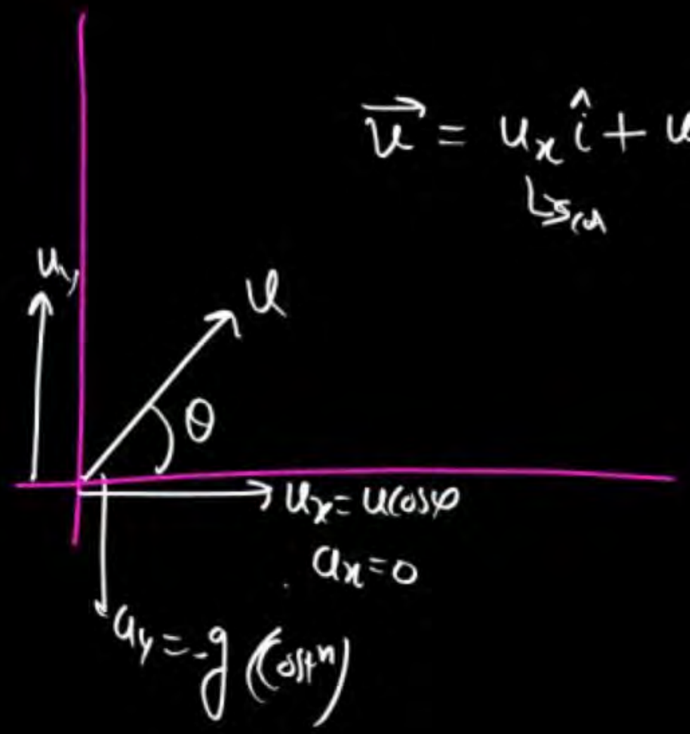



u
v
g
g
g
g
v
g

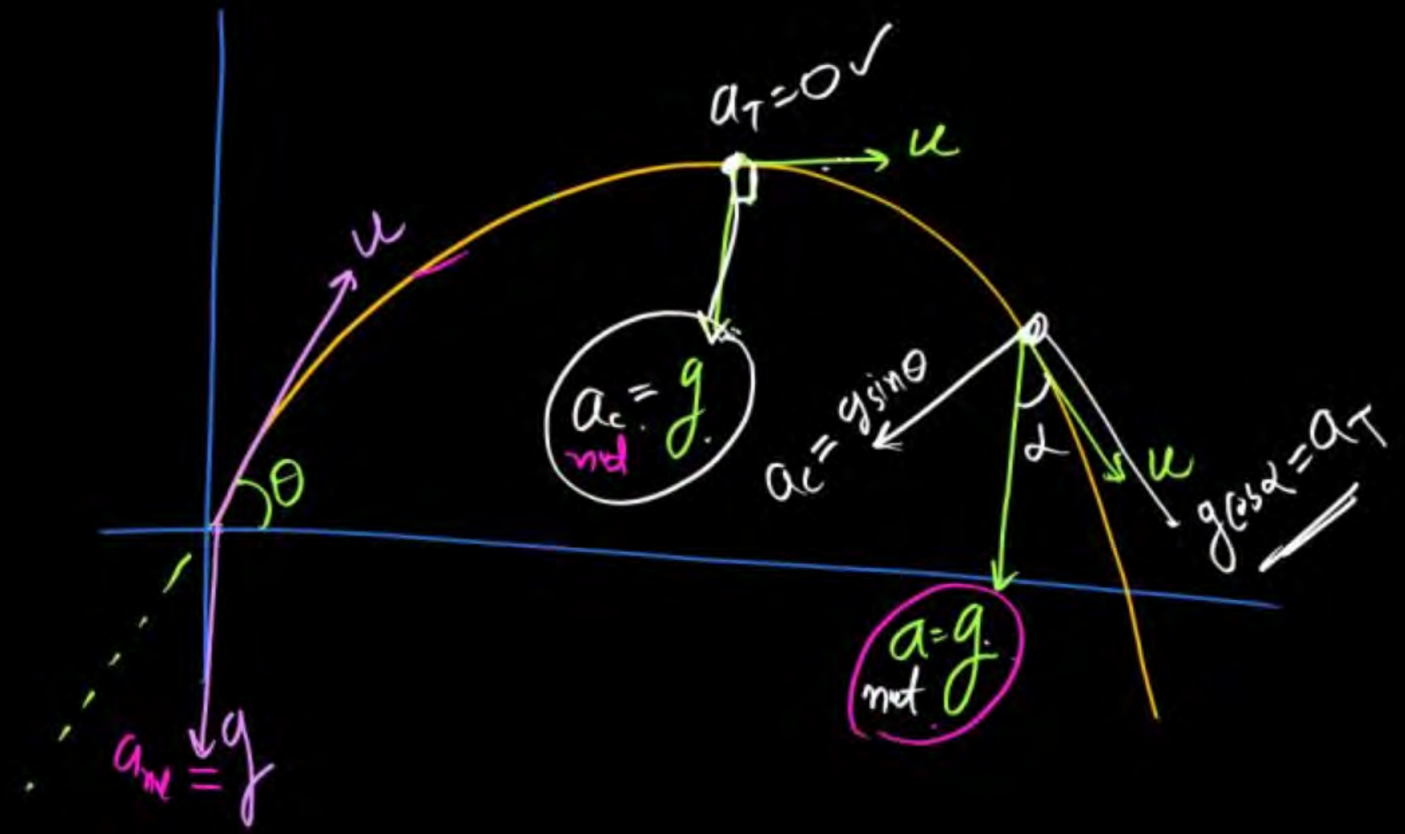
(2) Which of the following physical quantity remains constant in projectile Motion. (NEET)

(a) ✗ Speed (b) ✗ velocity (c) ✓ acceleration (d) ✓ Horizontal velocity

(e) ✗ tangential acceleration. ✗



$$\vec{u} = u_x\hat{i} + u_y\hat{j}$$



AIIMS-2017
Not fraud

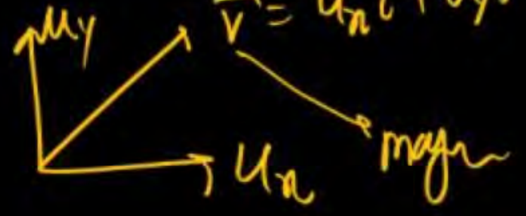
(Q) Object is moving such that its **Rate of change in velocity** (→ acc^n) is cost^n ✓
but **rate of change in speed** (→ Tangential acc^n) is variable, so this motion possible??

(a) Yes → Uniform circular ✗ → In circular motn dir^n of acc^n is vari.

(b) No, never

(c) Yes, Projectile

magnitude of velocity is speed



Question

Particle is projected and its velocity at time 't' is $\vec{v} = \alpha\hat{i} + (\beta - \gamma t)\hat{j}$ then find H, R, T angle of projection.

JEE → 2020

$\vec{v}_t = \alpha\hat{i} + (\beta - \gamma t)\hat{j}$

$\vec{a} = \frac{d\vec{v}}{dt} = 0\hat{i} - \gamma\hat{j} = -\gamma\hat{j}$

initial velocity $(t=0)$

$\vec{u} = \alpha\hat{i} + \beta\hat{j}$

$u_x = \alpha$ $\quad u_y = \beta$

$H_{max} = \frac{(u_y)^2}{2a_y}$ ← critical velocity

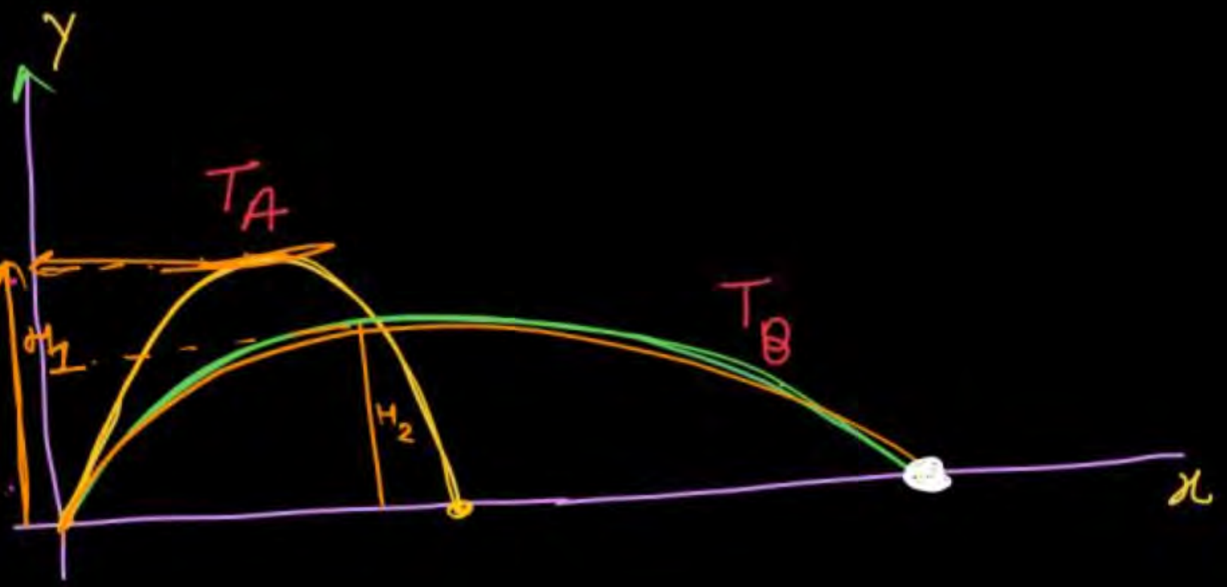
$H_{max} = \frac{\beta^2}{2\gamma}$

$T_f = \frac{2u_y}{a_y}$

$T = \frac{2\beta}{\gamma}$

$R = u_x T_f = \frac{\alpha 2\beta}{\gamma}$

$\tan\theta = \frac{\beta}{\alpha}$



Which of the following is correct :-

(a) $T_A = T_B$

(b) $T_A > T_B$

(c) $T_A < T_B$

(d) Nothing to say

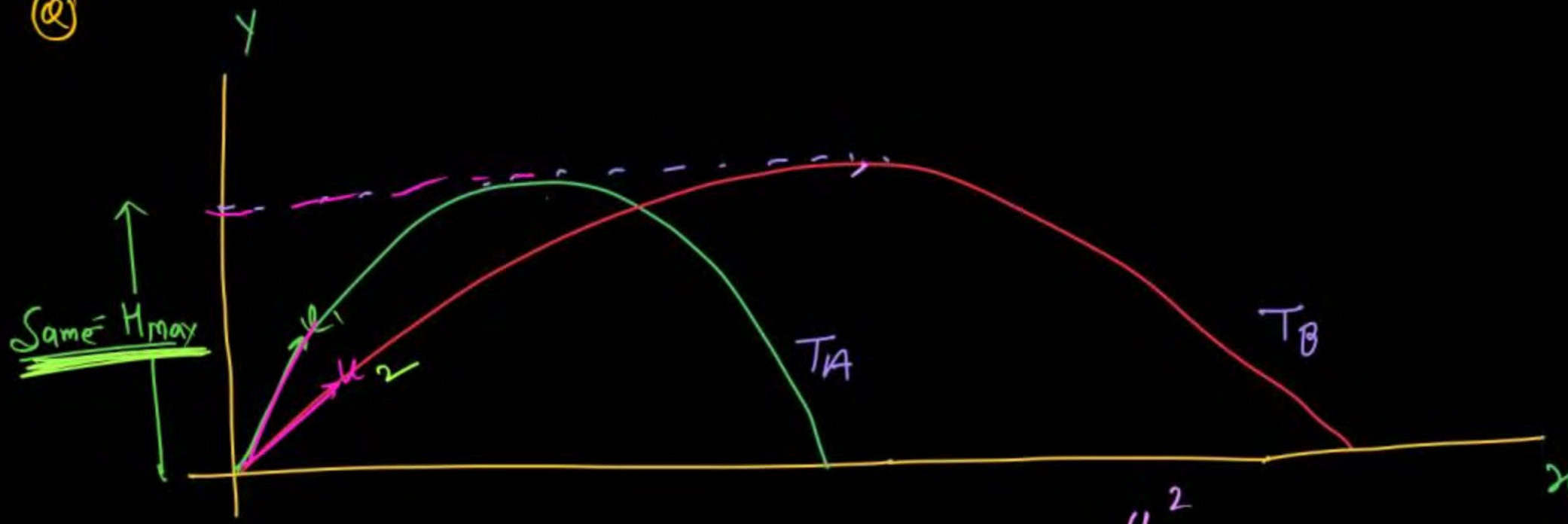
(b) $H_{max_1} > H_{max_2}$

$\frac{u_{y_1}^2}{2g} > \frac{u_{y_2}^2}{2g}$

$u_{y_1} > u_{y_2}$

$T = \frac{2u_y}{g}$

Q)



(a) $T_A = T_B$

(b) $T_A > T_B$

(c) $T_A < T_B$

$H_{max} = \frac{u_y^2}{2g}$ ✗

✓ Same

u_y = will be same

$T_f = \frac{2u_y}{g}$ = Same

(iv)

Level up

Ball is at same height $t_A = 4\,sec$ & $t_B = 8\,sec$ then find speed of Projection & Angle of Projection ??

Soln

Consider motn in x-axis only :—

from AB

$x_{AB} = 80\,m$

$t_{AB} = 8 - 4 = 4\,sec$

$x = u_x t$

$80 = u_x \times 4$

20

$u_x = 20$

Motion in y-axis

$T_f = 4 + 8 = 12\,sec$

$\frac{2u_y}{g} = 12 \times 6$

$u_y = 60\hat{j}$

$\tan\theta = \frac{60}{20}$

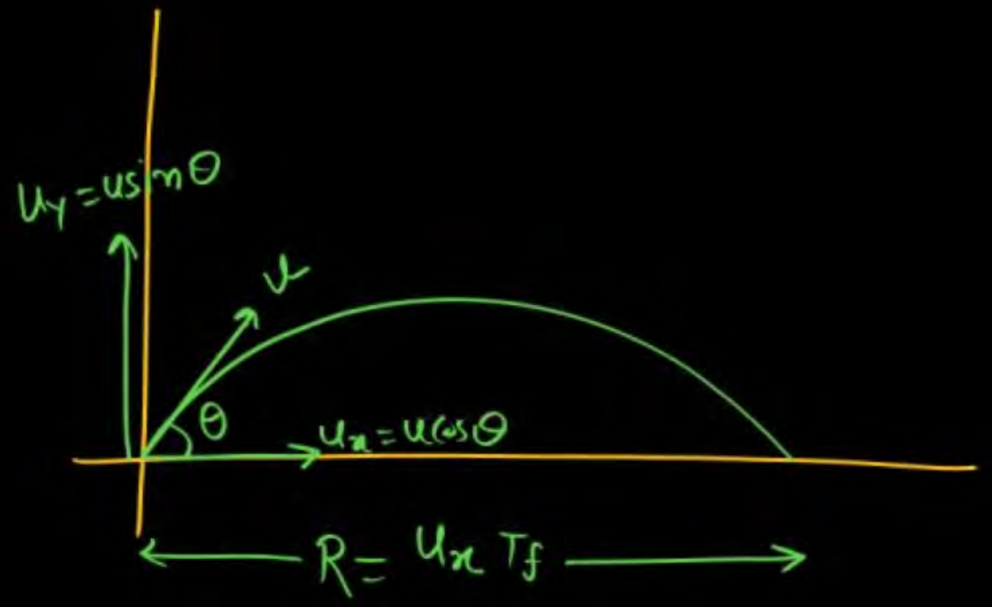
$\tan\theta = 3$

Speed $= \sqrt{(20)^2 + (60)^2}$

$\vec{v} = 20\hat{i} + 60\hat{j}$

Condition of Maximum Horizontal Range :- (NEET)

Likho



$$R = u\cos\theta \times \left[\frac{2u\sin\theta}{g}\right]$$

$$R = \frac{u^2\, 2\sin\theta\cos\theta}{g}$$

$$R = \frac{u^2 \sin(2\theta)}{g}$$

$$R_{max} = \frac{u^2\ (\sin 2\theta)_{max}}{g}$$

$$R_{max} = \frac{u^2}{g}$$

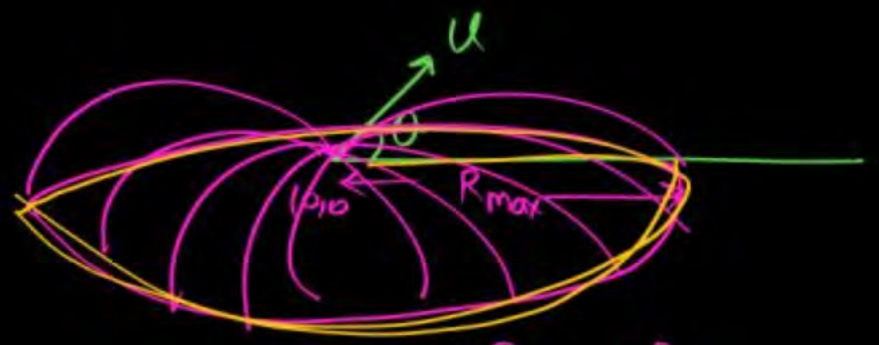
At $\theta = 45°$

$\sin(2\theta)_{max} = 1$

at $2\theta = 90°$

$\theta = 45°$

Ball is Projected with u at diff^{n} Angle many times then Maximum Area can be covered by Projected Ball.



$$R_{max} = \frac{u^2}{g}$$

at $\theta = 45°$

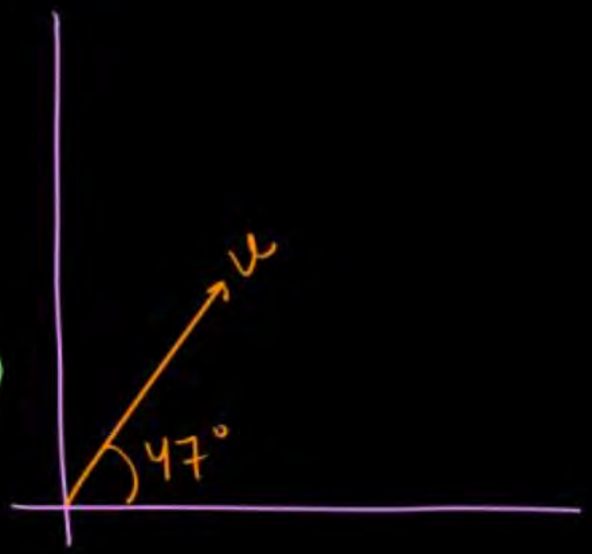
$$\text{Area} = \pi(\text{Radius})^2$$

$$= \pi\left(\frac{u^2}{g}\right)^2$$

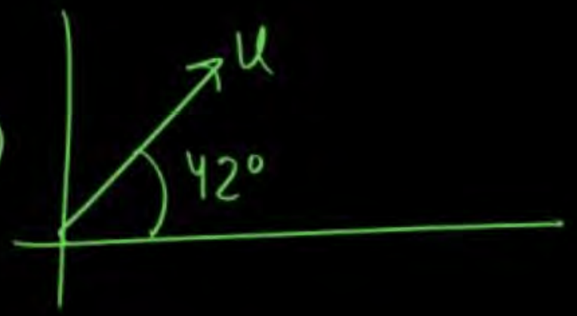
$$= \left[\frac{\pi u^4}{g^2}\right] A_2$$

Q)

(A)



(B)



~~(a)~~ $R_A = R_B$

~~(b)~~ $R_A > R_B$

(C) $R_A < R_B$

42° 43 44 45° 46° 47° 48°

MR* Box

Angle jitna 45° se dur hoga range utna kam hoga

$R_{47^\circ} > R_{42^\circ}$

$R_{42^\circ} = R_{48}$

42
48
90°

(Q) Two Ball is projected with same speed u at angle α and β. if $\alpha+\beta=90^\circ$ then Range will be same. [Complementray Angle]

$$R_1 = \frac{u^2 \sin 2\alpha}{g} \quad -(I)$$

$$R_2 = \frac{u^2 \sin(2\beta)}{g} \quad -(II)$$

If $\alpha+\beta=90^\circ$

$\beta = 90-\alpha$

$$R_2 = \frac{u^2 \sin 2(90-\alpha)}{g}$$

$$= \frac{u^2 \sin(180-2\alpha)}{g}$$

$$R_2 = \frac{u^2 \sin 2\alpha}{g} = R_1$$

α	β
30°	60°
20°	70°
10°	80°
$\alpha=(\frac{\pi}{4}-\theta)$	$\beta=(\frac{\pi}{4}+\theta)$
18°	72°

IIT-Adv-2016

Two Ball is Projected with same speed at angle α and β such that its Range is same then find

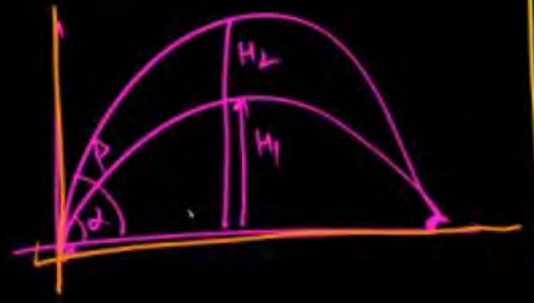
(i) $\frac{H_1}{H_2}$ (Ratio of max^m Height)

(ii) $H_1 H_2$

(iii) T_1/T_2

(iv) $T_1 T_2$

(v) Range in terms of T_1 & T_2



Soln

$\alpha + \beta = 90^\circ$ *

(i) $H_1 = \frac{u^2 \sin^2\alpha}{2g}$ — ①

$H_2 = \frac{u^2 \sin^2(90-\alpha)}{2g} = \frac{u^2 \cos^2\alpha}{2g}$ — ②

$\boxed{\frac{H_1}{H_2} = \tan^2\alpha}$ *

(iii) $T_1 = \frac{2u\sin\alpha}{g}$

$T_2 = \frac{2u\sin\beta}{g} = \frac{2u\sin(90-\alpha)}{g} = \frac{2u\cos\alpha}{g}$

$\boxed{\frac{T_1}{T_2} = \tan\alpha}$

(ii) $H_1 = \frac{R\tan\alpha}{4}$

$H_2 = \frac{R\tan\beta}{4} = \frac{R\tan(90-\alpha)}{4}$

$H_1 \times H_2 = \frac{R\tan\alpha}{4}\left(\frac{R\cot\alpha}{4}\right)$

$\boxed{H_1 H_2 = \frac{R^2}{16}}$ $\quad R = 4\sqrt{H_1 H_2}$

(iv) $T_1 \cdot T_2 = \frac{2u\sin\alpha}{g} \times \frac{2u\cos\alpha}{g}$

$T_1 \cdot T_2 = \frac{2u^2 \times 2\sin\alpha\cos\alpha}{g^2}$

$$2\sin\alpha\cos\alpha = \sin(2\alpha)$$

$$R = \frac{u^2 \sin 2\alpha}{g}$$

$$T_1 \cdot T_2 = \frac{2u^2 \sin 2\alpha}{g \times g}$$

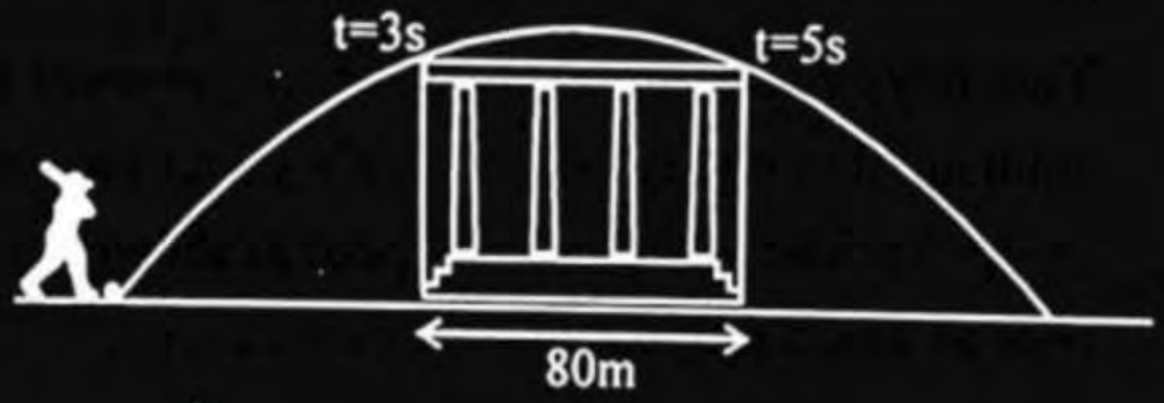
$$T_1 \cdot T_2 = \frac{2}{g} R$$

$$R = \frac{1}{2} g (T_1 T_2)$$

No need to remember

Question H/Q

The six hit by CHRIS GAYLE in IPL just misses a building of length 80 m as shown in figure. The angle of projection with horizontal is:

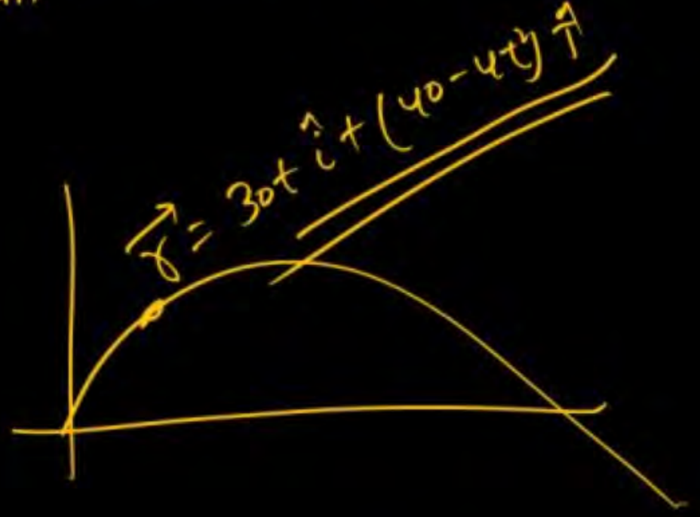


1. 45°
2. 30°
3. 60°
4. 15°

Q Ball is Projected and its Position at time t is $\vec{r} = 30t\,\hat{i} + (40t - 4t^2)\,\hat{j}$ (Positive)

Then find Range :-

$$\vec{r} = 30t\,\hat{i} + (40t - 4t^2)\,\hat{j}$$



↳ Rough ✗ Solve ✗

Range = 240m ✗ MR Scam ✓

$\vec{r} = 30t\,\hat{i} + (40t - 5t^2)\,\hat{j}$

$R = 240\ m$

Ball is projected with 100m/s at 53° then find its speed when it is moving at 37° from Horizontal.

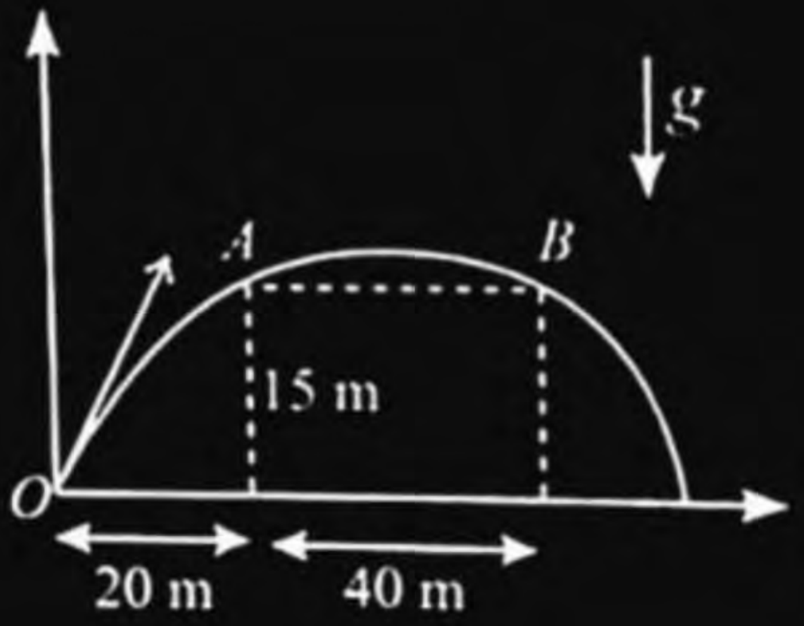
H/W

→ must do

Question

In the projectile motion shown in figure, given $t_{AB} = 2$ sec, then (take, $g = 10\ ms^{-2}$)

1. Particle is at point 'B' at 3 sec
2. Maximum height of projectile is 20 m
3. Initial vertical component of velocity is $20\ ms^{-1}$
4. Horizontal component of velocity is $20\ ms^{-1}$



Question

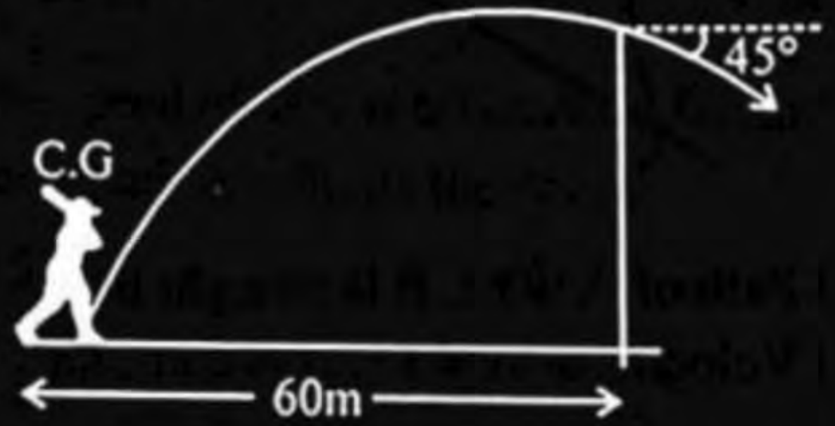
The trajectory of projectile is $y = x(1 - x)$, where 'y' and 'x' are in metres.
Choose the CORRECT option(s).

1. Horizontal range is 1m
2. The angle of projection is 45°
3. The horizontal range is 2m
4. The horizontal range is 30°

Paragraph

In an IPL "Chris Gayle" of RCB hit a six which lands on the roof of Stadium situated at a distance of 60 m from Gayle. If time of flight of ball is 4 sec and ball hits the stadium roof at an angle of 45° with horizontal in downward direction then:

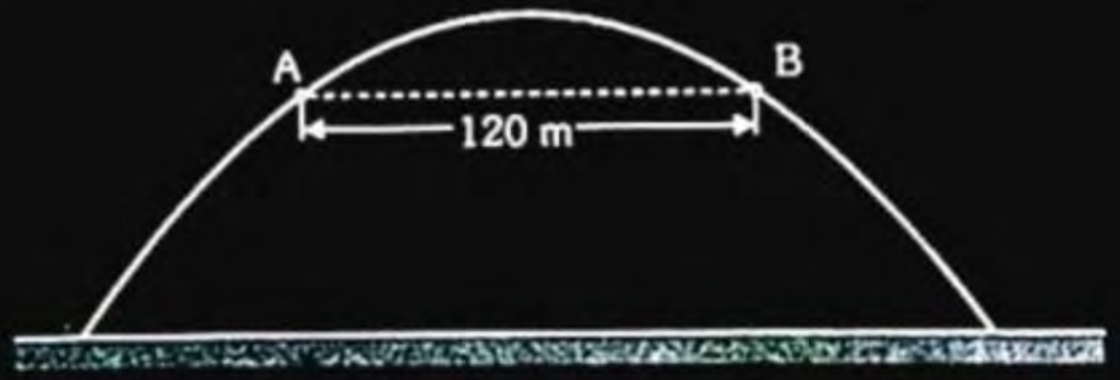
Initial speed of the ball when Gayle hit the ball was:



1. $\sqrt{150}$ m/s
2. $\sqrt{1250}$ m/s
3. $\sqrt{850}$ m/s
4. $\sqrt{1050}$ m/s

Question

A projectile passes two points A and B at same height after 2s and 6s of its projection. Horizontal separation between the points A and B is 120 m. The horizontal range is closest to [$g = 10\ m/s^2$]

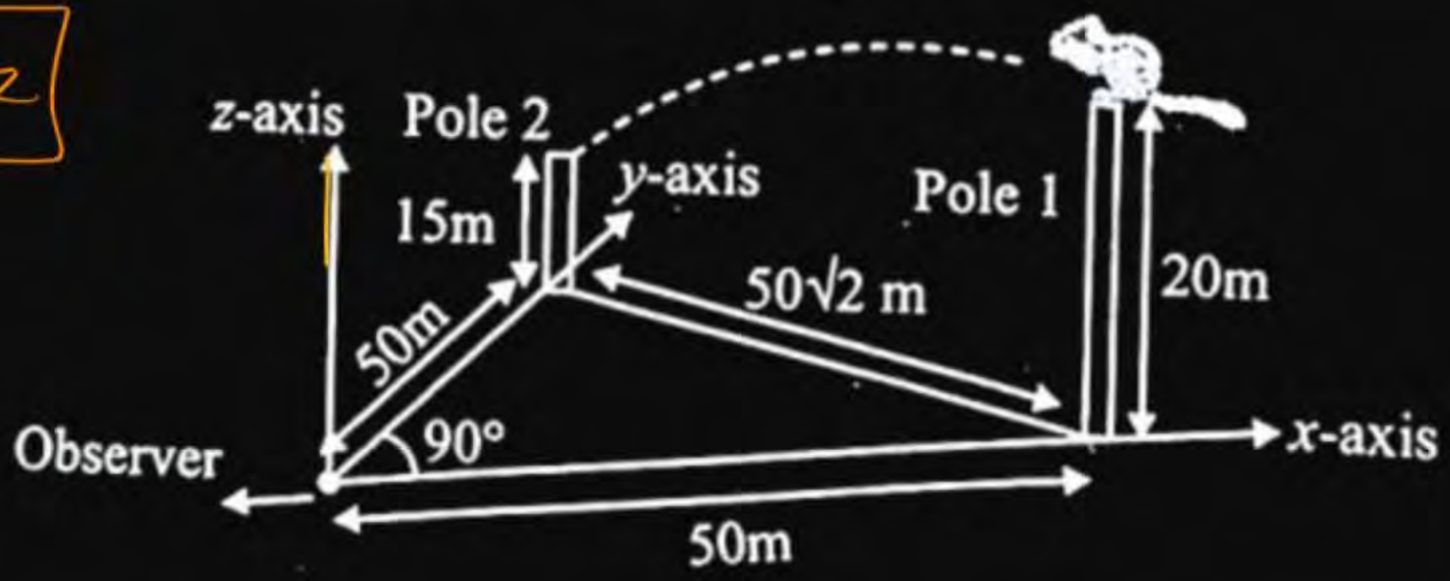


1. 180 m
2. 200 m
3. 240 m
4. 260 m

Question

A small squirrel jumps from pole 1 to pole 2 in horizontal direction. Squirrels is observed by a very small observer at origin. What is average velocity vector of squirrel? If average velocity vector is expressed as $v_x\hat{\imath} + v_y\hat{\jmath} + v_z\hat{k}$, express your answer as sum of magnitudes of its components $|v_x| + |v_y| + |v_z|$ in unit m/s.

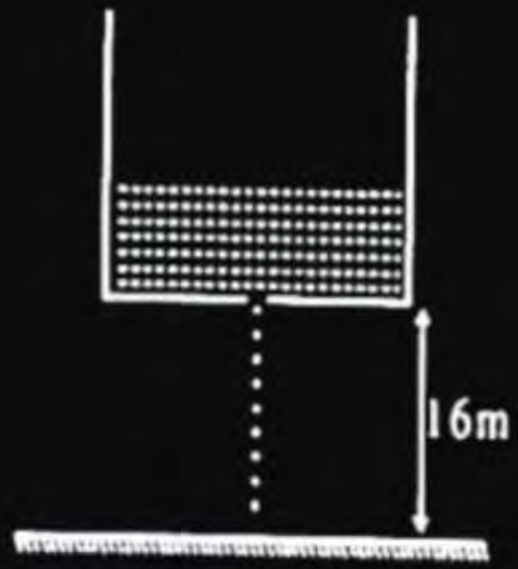
Find only disp^m in x, y & z



Question

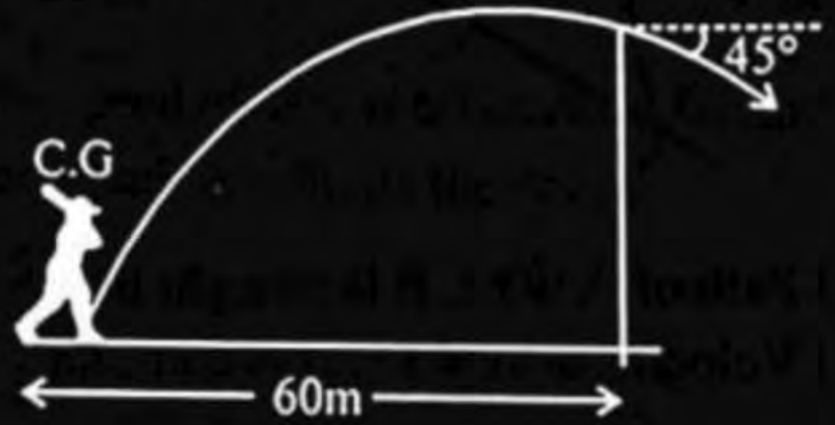
Water drops fall with negligible velocity at regular intervals from a hole at the bottom of a vessel placed 16m from the ground. The ninth drop is about to fall when the first drop just falls on the floor. Find the distance between the third and fifth drop at this instant in meters.

1. 2
2. 5
3. 8
4. 9



Paragraph

In an IPL "Chris Gayle" of RCB hit a six which lands on the roof of Stadium situated at a distance of 60 m from Gayle. If time of flight of ball is 4 sec and ball hits the stadium roof at an angle of 45° with horizontal in downward direction then:



Height of roof of stadium where ball hits from the ground is:

1. 60 m
2. 40 m
3. 20 m
4. None

Question

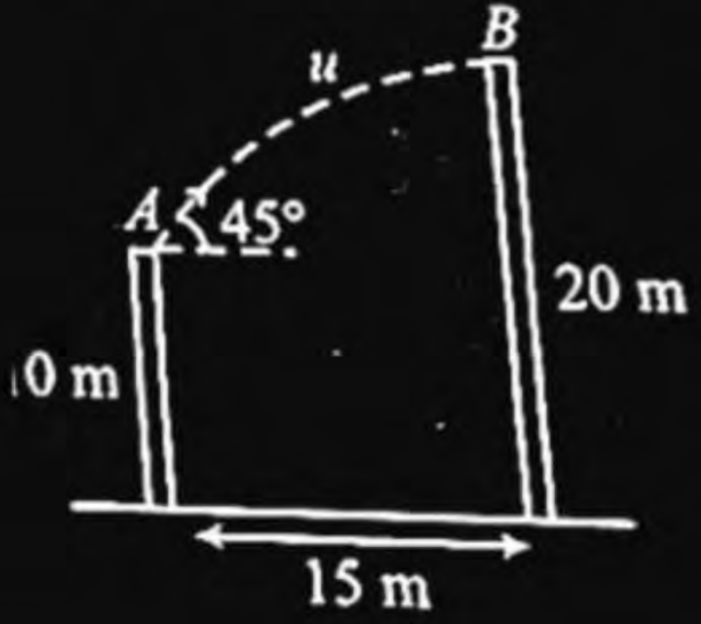
A stone is projected form a horizontal plane. It attains maximum height 'H' and strikes a stationary smooth wall and falls on the ground vertically below the maximum height. Assume the collision to be elastic, the height of the point on the wall where ball will strike is:

1. H/2
2. H/4
3. 3H/4
4. None of these

Question

Find the value of 'u' so that the ball reaches at point B. (Take $g = 10\ \text{m/s}^2$)

1. $20\ \text{m/s}$
2. $40\ \text{m/s}$
3. $15\sqrt{2}\ \text{m/s}$
4. $50\ \text{m/s}$

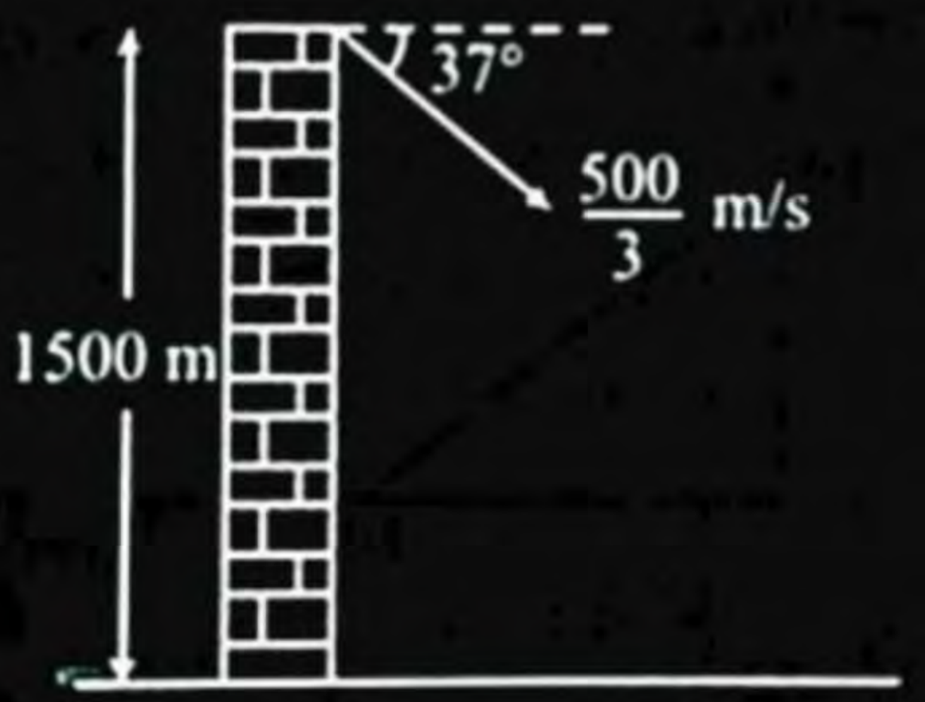


Question

A particle is projected from a tower as shown in figure, then the distance from the foot of the tower where it will strike the ground will be:

(take $g = 10\ m/s^2$)

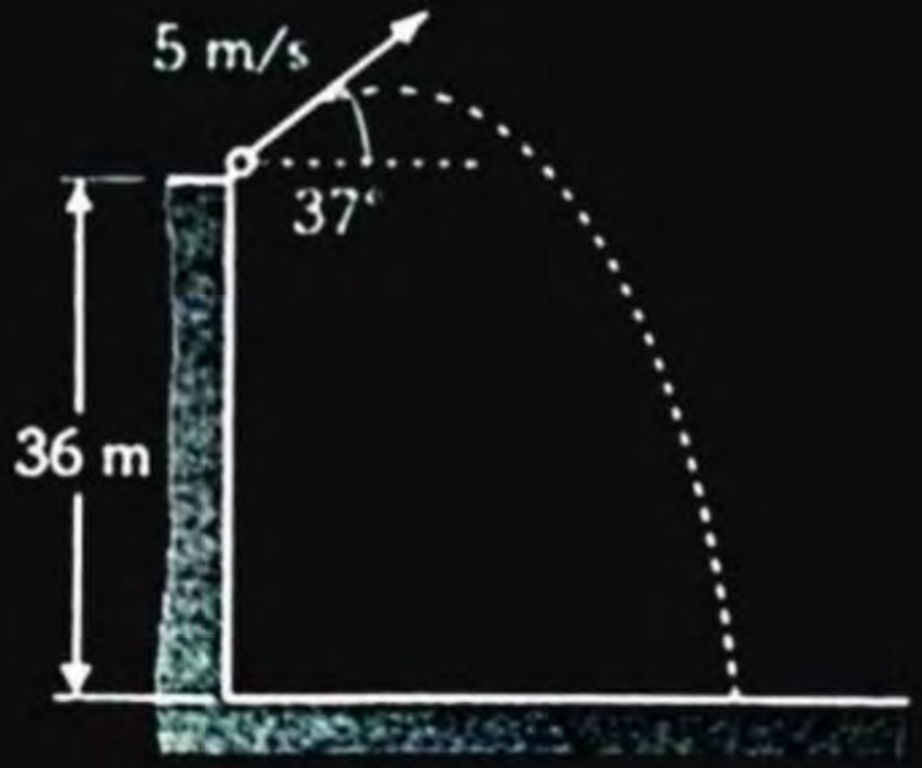
1. 4000/3 m
2. 5000/3 m
3. 2000 m
4. 3000 m



Question

A ball is thrown from the top of 36 m high tower with velocity 5 m/s at an angle 37° above the horizontal as shown. Its horizontal distance on the ground is closest to

$[g = 10\ m/s^2]$

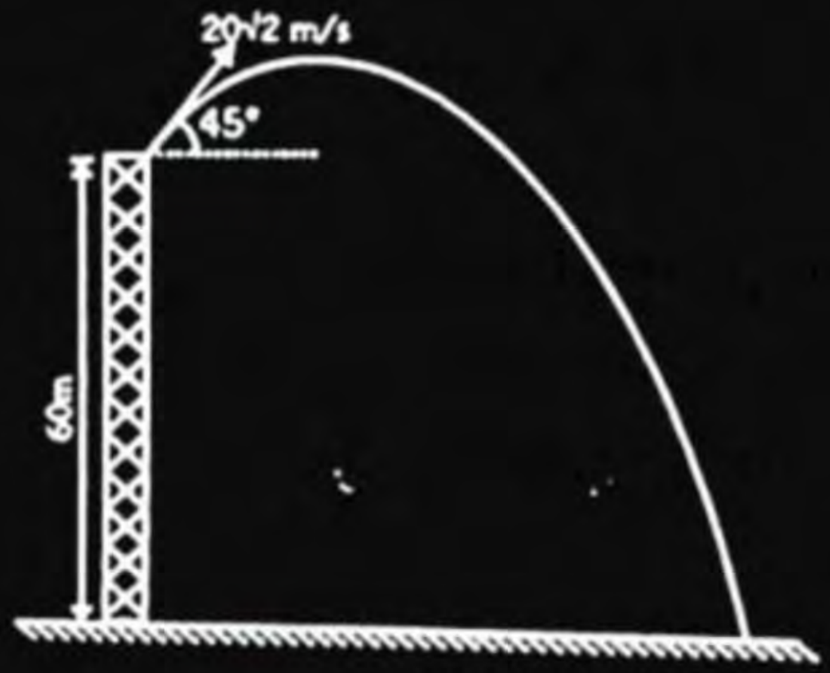


1. 12 m
2. 18 m
3. 24 m
4. 30 m

Question

A ball is thrown from the top of a 60 m high tower with velocity $20\sqrt{2}$ m/s at 45° elevation as shown in figure. Find radius of curvature of path at highest point.

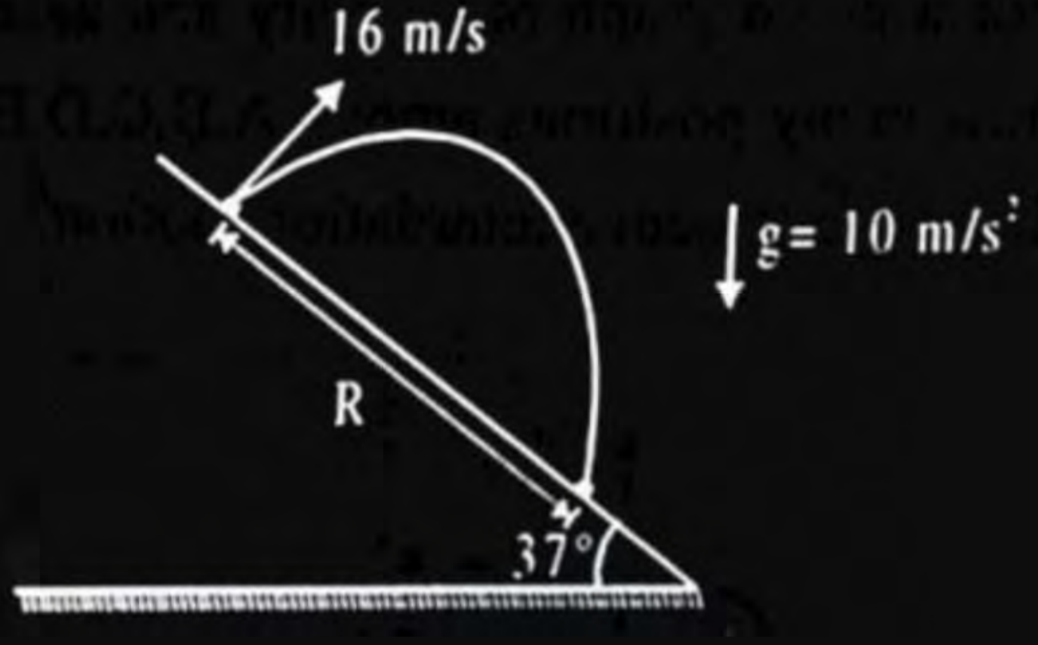
($g = 10\ m/s^2$)



1. 10 m
2. 20 m
3. 40 m
4. 200 m

Question

A projectile is launched with a velocity of 16 m/s at right angles to the slope which is inclined at 37° with the horizontal. The value of R is:



1. 96 m
2. 48 m
3. 72 m
4. None of these

THANK YOU