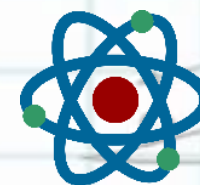




# IT Fizika



Ibrohim Fayziyev

## Fizikadan masalalar va ularning izohli yechim

**Mavzu:** Og'irlik kuchi ta'sirida harakat, erkin tushish

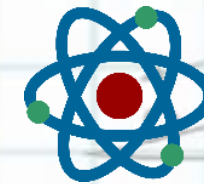
Masalalarni yechilish tartibini va to'liq izohli yechimini  
You Tube dagi **IT Fizika** kanalida ko'rishingiz mumkin.

Toshkent 2021-yil





# IT Fizika



Ibrohim Fayziyev

Erkin tushish boshlanganidan 4 s o'tgan paytda jism tezligi necha m/s bo'ladi?

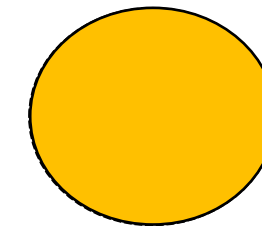
**Berilgan:**

$$t = 4 \text{ s}$$
$$v = ?$$

**Yechilishi:**

Erkin tushishda jismning tezligi  $v = v_0 + gt$  qonuniyat bo'yicha o'zgaradi. Lekin bu masalada jism boshlang'ich tezliksiz tashlab yuborilgani uchun biz bu qonuniyatni  $v = gt$  deb yozib olamiz.

$$v = 10 \cdot 4 = 40 \text{ m/s.}$$



$$v_0 = 0$$



$mg$

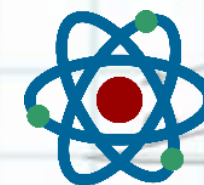
$$v = v_0 + gt$$







# IT Fizika



Yerga erkin tushayotgan jism beshinchi sekund oxirida qanday tezlikka erishadi (m/s.)?

**Berilgan:**

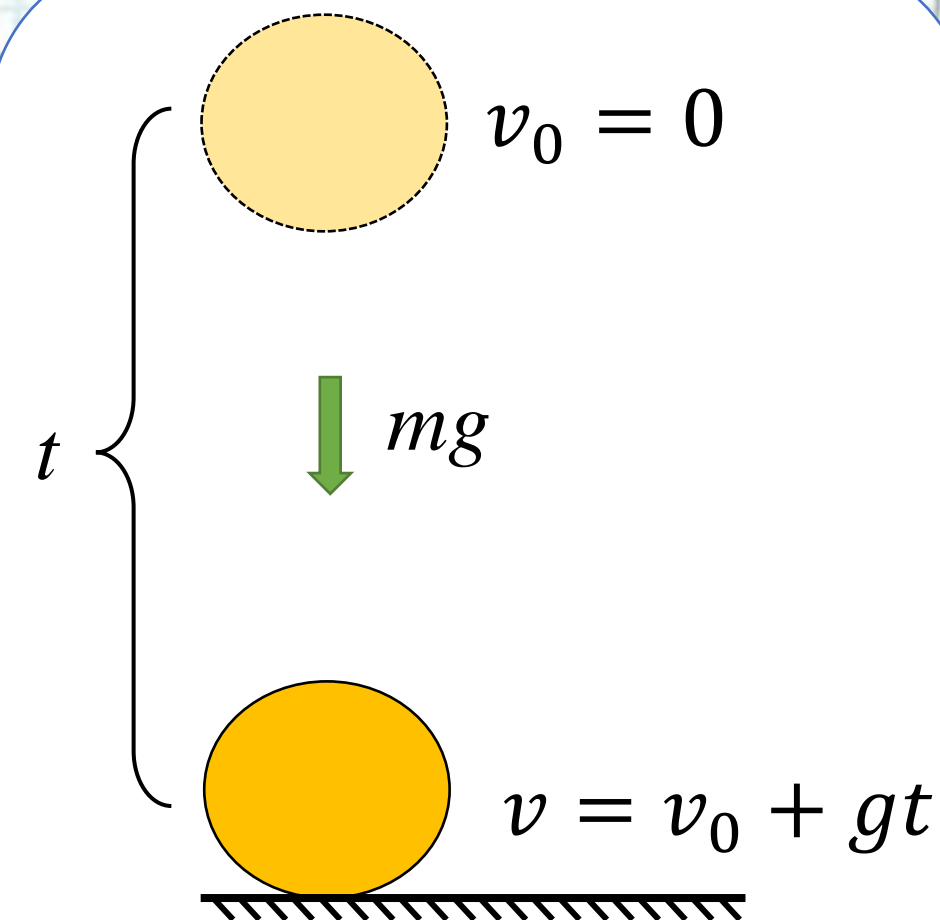
$$t = 5 \text{ s}$$

$$v = ?$$

**Yechilishi:**

Erkin tushishda jismning tezligi  $v = v_0 + gt$  qonuniyat bo'yicha o'zgaradi.  $v_0 = 0$  bo'lgani uchun  $v = gt$  bo'ladi.

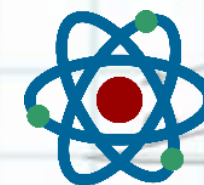
$$v = 10 \cdot 5 = 50 \text{ m/s.}$$







# IT Fizika



Ibrohim Fayziyev

Erkin tushayotgan jismning 2- va 5-sekundlar oxiridagi tezliklari nisbatini toping.

**Berilgan:**

$$t_1 = 2 \text{ s}$$

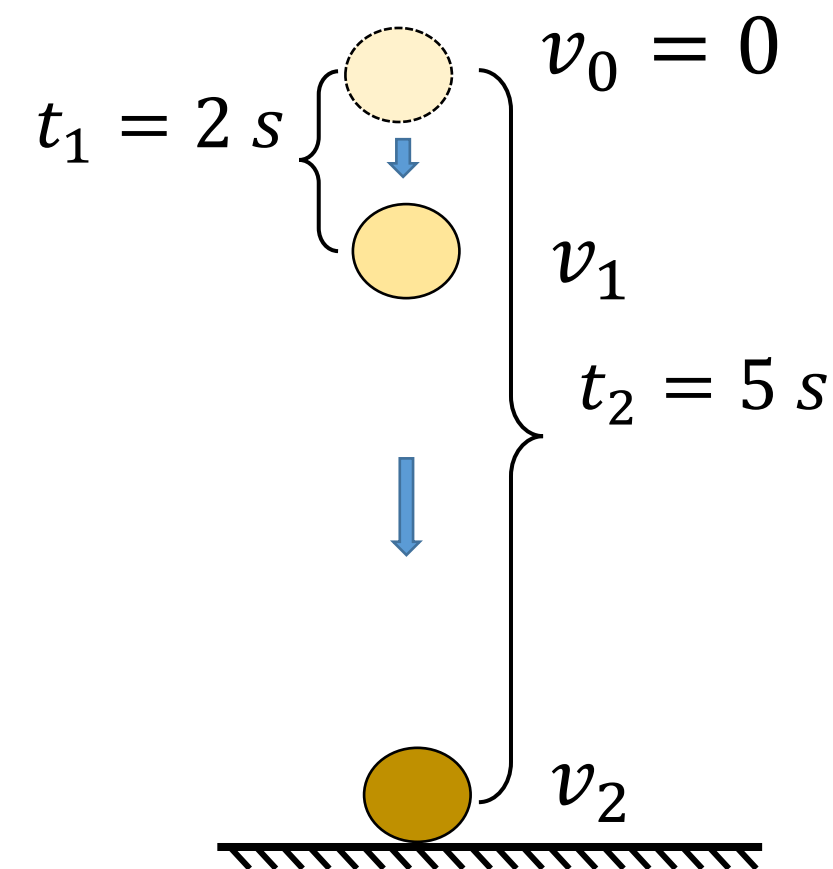
$$t_2 = 5 \text{ s}$$

$$v_1/v_2 = ?$$

**Yechilishi:**

Erkin tushishda jismning tezligi  $v = v_0 + gt$  qonuniyat bo'yicha o'zgarishi bizga ma'lum. Ushbu masalani quyidagi nisbat orqali echamiz:

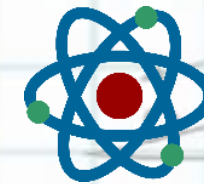
$$\frac{v_1}{v_2} = \frac{gt_1}{gt_2} = \frac{t_1}{t_2} = 0,4$$







# IT Fizika



Erkin tushayotgan jismning boshlang'ich tezligi  $6 \text{ m/s}$  bo'lsa, uning  $1 \text{ s}$  dan keyingi tezligi necha  $\text{m/s}$  bo'ladi?

**Berilgan:**

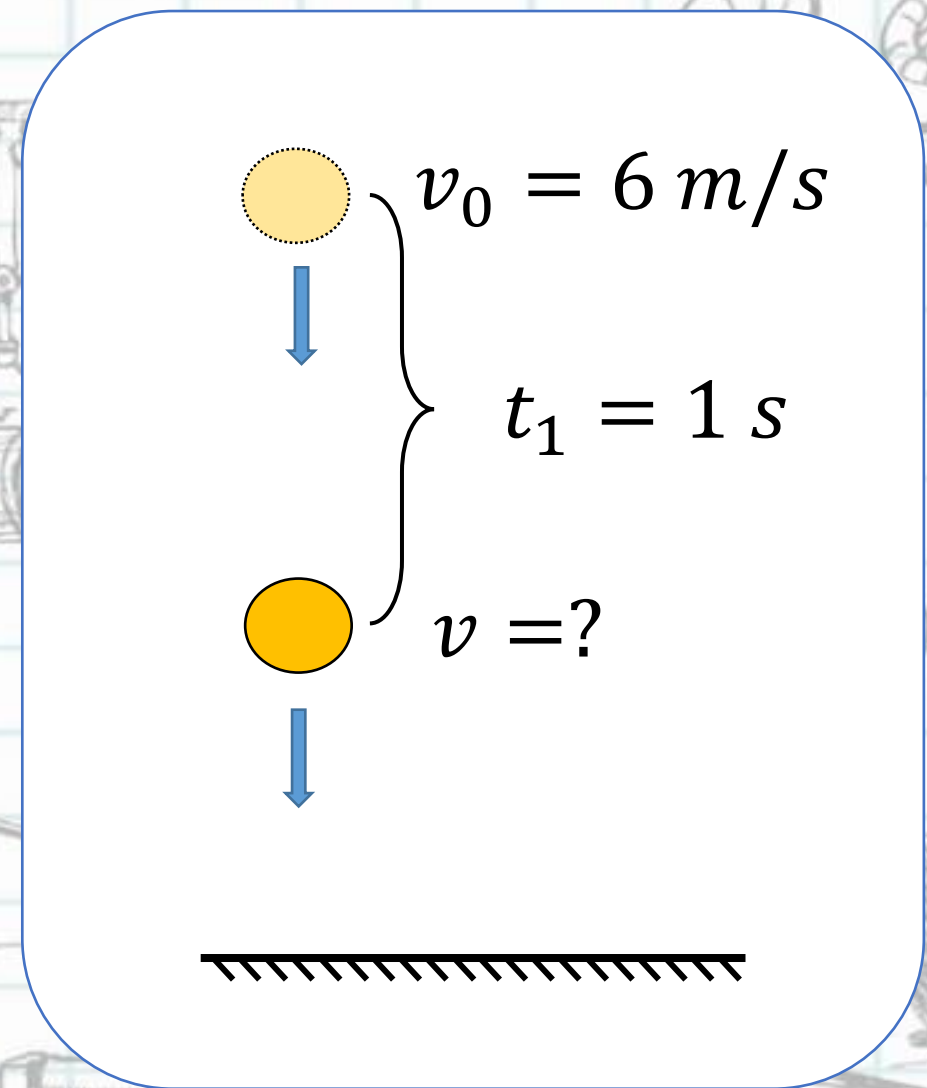
$v_0 = 6 \text{ m/s}$   
 $t = 1 \text{ s}$

$v = ?$

**Yechilishi:**

Erkin tushishda jismning tezligi  $v = v_0 + gt$  qonuniyat bo'yicha o'zgaradi.

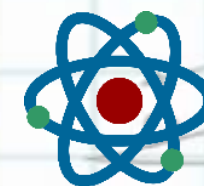
$$v = 6 + 10 \cdot 1 = 16 \text{ m/s.}$$







# IT Fizika



Erkin tushayotgan jism  $7 \text{ m/s}$  boshlang'ich tezlikka ega bo'lsa, u  $2 \text{ s}$  dan keyin qanday tezlikka ( $\text{m/s}$ ) erishadi?  $g=9,8 \text{ m/s}^2$ .

## Berilgan:

$$v_0 = 7 \text{ m/s}$$

$$t = 2 \text{ s}$$

$$v = ?$$

## Yechilishi:

Erkin tushishda jismning tezligi  $v = v_0 + gt$  qonuniyat bo'yicha o'zgaradi.

$$v = 7 + 9,8 \cdot 2 = 26,6 \text{ m/s.}$$

$$v_0 = 7 \text{ m/s}$$

$$t_1 = 2 \text{ s}$$

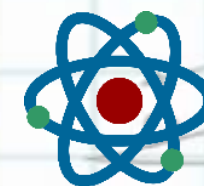
$$v = ?$$







# IT Fizika



Ibrohim Fayziyev

20 m/s boshlang'ich tezlik bilan erkin tushayotgan jismning harakat boshidan 4 s o'tgan paytdagi tezligi qanday (m/s) bo'ladi?  $g = 10 \text{ m/s}^2$ .

**Berilgan:**

$$v_0 = 20 \text{ m/s}$$

$$t = 4 \text{ s}$$

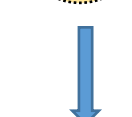
$$v = ?$$


**Yechilishi:**

Erkin tushishda jismning tezligi  $v = v_0 + gt$  qonuniyat bo'yicha o'zgaradi.

$$v = 20 + 10 \cdot 4 = 60 \text{ m/s.}$$


$$v_0 = 20 \text{ m/s}$$


$$t_1 = 4 \text{ s}$$

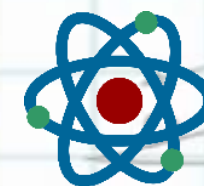

$$v = ?$$







# IT Fizika



Erkin tushayotgan jismning 2 s dan keyingi tezligi 30 m/s bo'lsa, uning boshlang'ich tezligi qanday (m/s)?

## Berilgan:

$$v = 30 \text{ m/s}$$

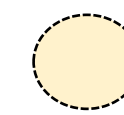
$$t = 2 \text{ s}$$

$$v_0 = ?$$

## Yechilishi:

Erkin tushishda jismning tezligi  $v = v_0 + gt$  qonuniyat bo'yicha o'zgarishidan foydalanib erkin tushayotgan jismni boshlang'ich tezligini topamiz.

$$v_0 = v - gt \quad v_0 = 30 - 10 \cdot 2 = 10 \text{ m/s.}$$



$$v_0 = ?$$

$$t_1 = 2 \text{ s}$$



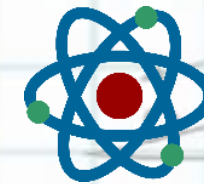
$$v = 30 \text{ m/s}$$







# IT Fizika



Balkondan boshlang'ich tezliksiz tashlangan jism 2 s da erga tushdi. Jism necha metr balandlikdan tashlangan?  $g=10 \text{ m/s}^2$ .

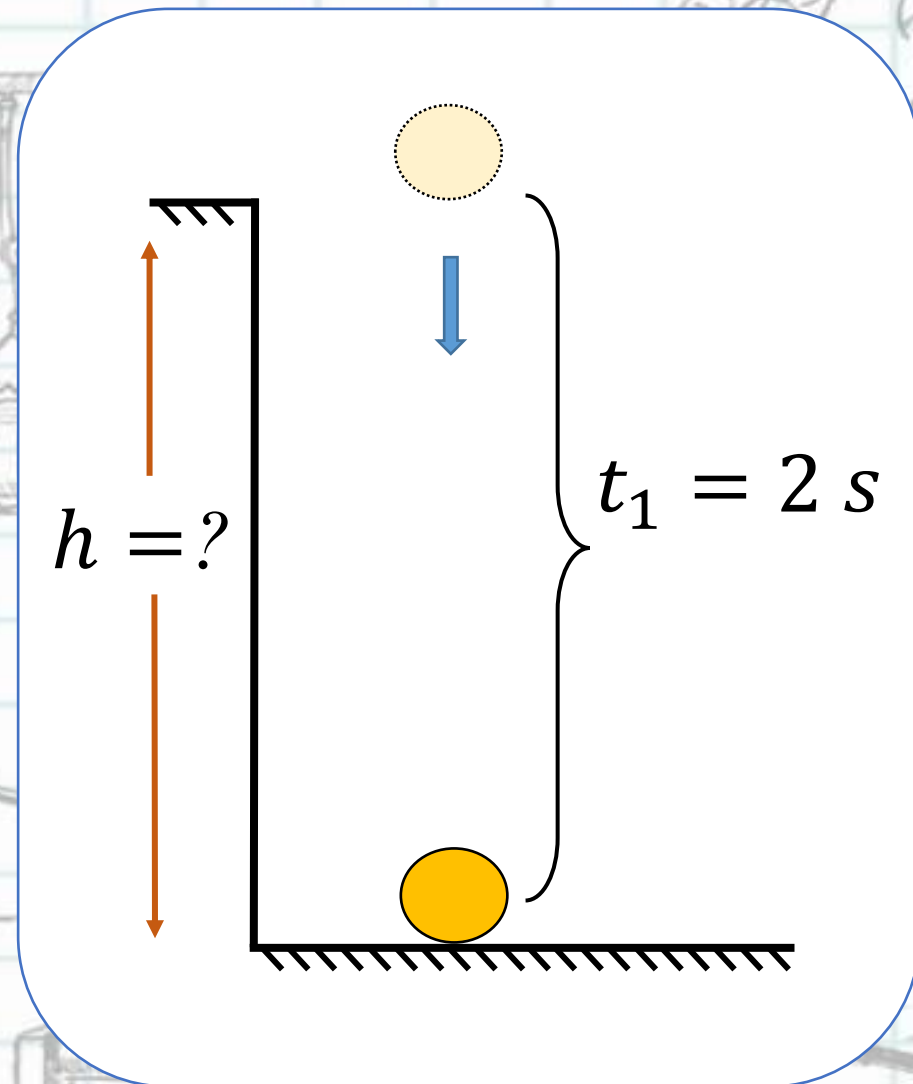
## Berilgan:

$$\begin{aligned}v_0 &= 0 \\t &= 2 \text{ s} \\h &=?\end{aligned}$$

## Yechilishi:

Erkin tushishda jismning tushish balandligi  $h = v_0 t + \frac{gt^2}{2}$  formula orqali topiladi. Boshlang'ich tezlik nolga tengligidan bu formulani quyidagicha yozish mumkin.  $h = \frac{gt^2}{2}$

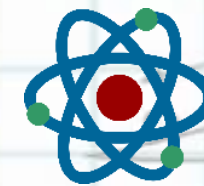
$$h = \frac{10 \cdot 2^2}{2} = 20 \text{ m.}$$







# IT Fizika



Erkin tushayotgan jism harakatining boshlang'ich 3 sekundida necha metr ko'chadi?  $g=10 \text{ m/s}^2$ .

**Berilgan:**

$$v_0 = 0$$

$$t = 3 \text{ s}$$

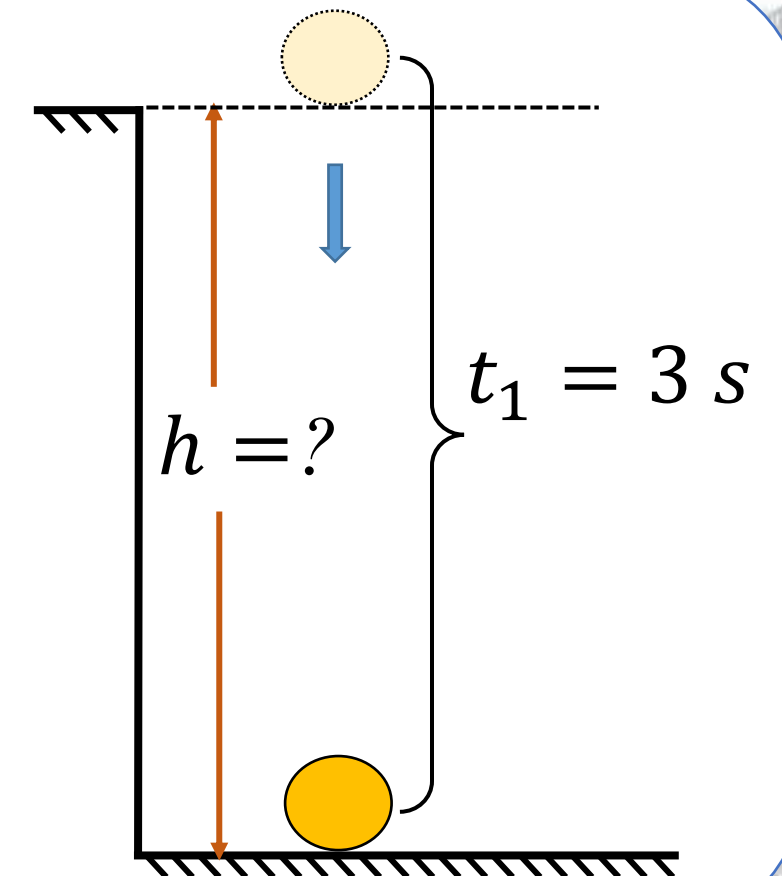
$$h = ?$$

**Yechilishi:**

Erkin tushishda jismning tushish balandligi

$h = v_0 t + \frac{gt^2}{2}$  formula orqali topiladi. Boshlang'ich tezlik nolga tengligidan bu formulani quyidagicha yozish mumkin.

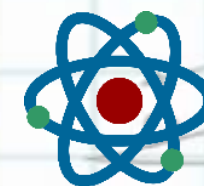
$$h = \frac{gt^2}{2} \quad h = \frac{10 \cdot 3^2}{2} = 45 \text{ m.}$$







# IT Fizika



Qandaydir sayyorada jism 50 m balandlikdan 5 s da tushgan. Bu sayyorada erkin tushish tezlanishi qanday ( $\text{m/s}^2$ )?

**Berilgan:**

$$h = 50 \text{ m}$$

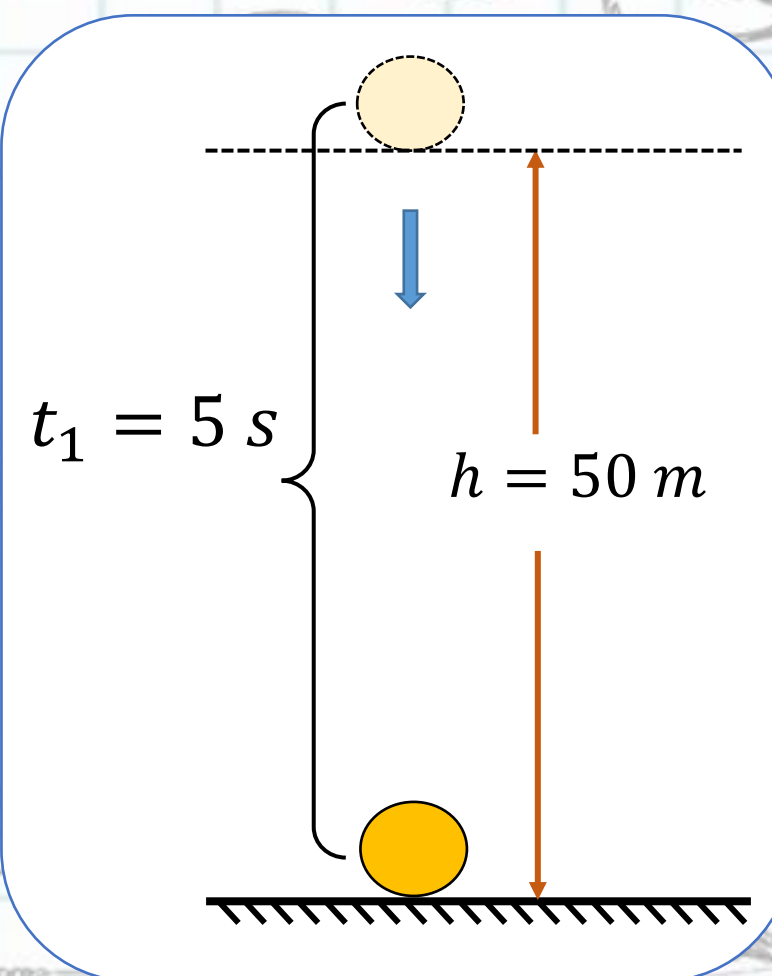
$$t = 5 \text{ s}$$

$$g = ?$$

**Yechilishi:**

Erkin tushishda jismning tushish balandligi  $h = v_0 t + \frac{gt^2}{2}$  formula orqali topiladi.  $v_0 = 0$  bo'lganligi uchun

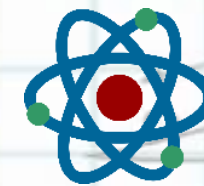
$$h = \frac{gt^2}{2} \Rightarrow g = \frac{2h}{t^2} \quad g = \frac{2 \cdot 50}{5^2} = 4 \text{ m/s}^2.$$







# IT Fizika



Boshlang'ich tezliksiz erkin tushayotgan birinchi jism ikkinchi jismga qaraganda 3 marta ko'p vaqt uchgan. Ularning ko'chishlari necha marta farq qiladi?

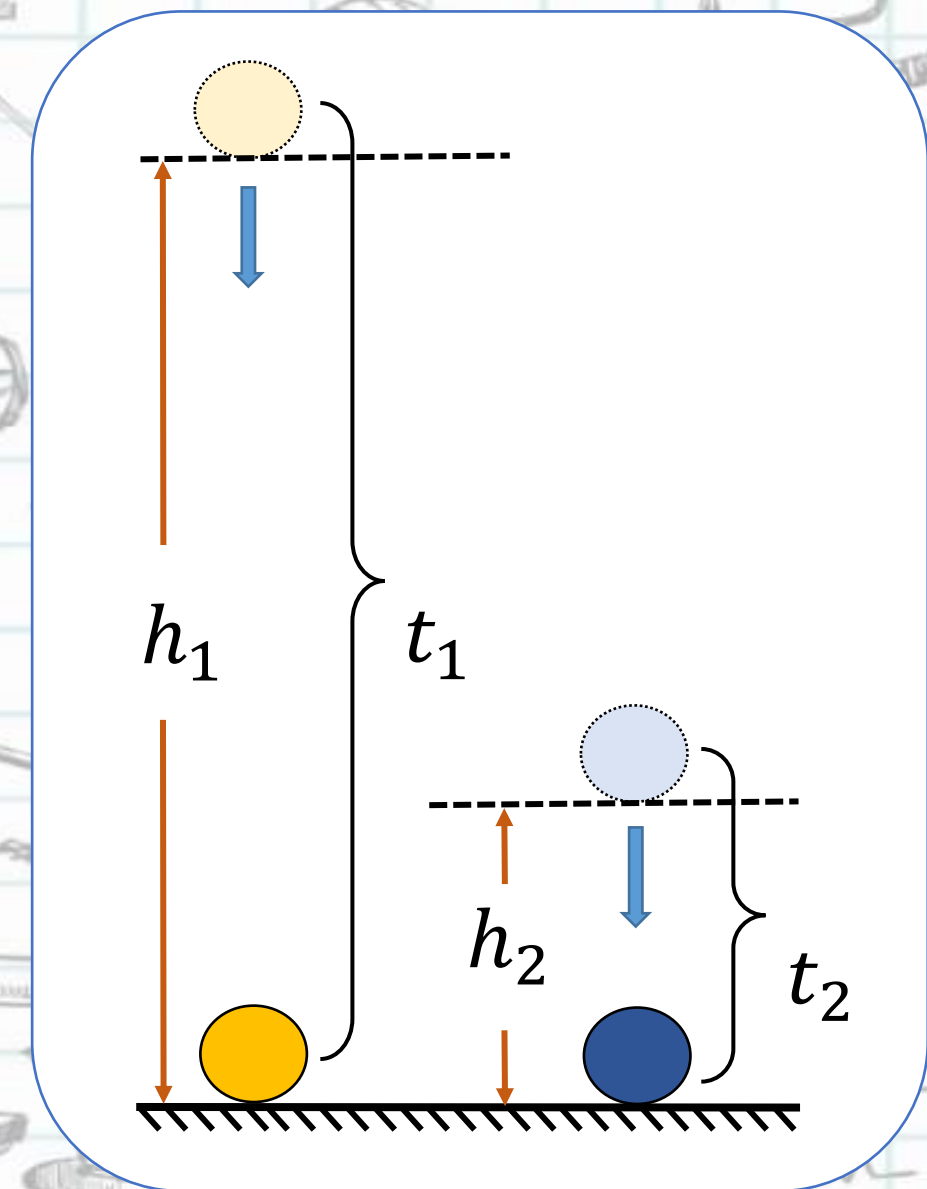
**Berilgan:**

$$t_1/t_2 = 3$$
$$h_1/h_2 = ?$$

**Yechilishi:**

Erkin tushayotgan jismning tushish balandligini boshlang'ich tezlik bo'lmagan holda  $h = \frac{gt^2}{2}$  ifoda orqali topar edik. Har ikkala jismning tushish balandliklari nisbatini olsak, quyidagi ko'rinish hosil bo'ladi:

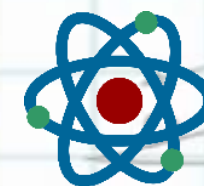
$$\frac{h_1}{h_2} = \frac{t_1^2}{t_2^2} = \left(\frac{t_1}{t_2}\right)^2 = 3^2 = 9$$







# IT Fizika



Boshlang'ich tezliksiz erkin tushayotgan jismning boshlang'ich uch va to'rt sekundda o'tgan yo'llari nisbati qanday bo'ladi?

**Berilgan:**

$$t_1 = 3 \text{ s}$$

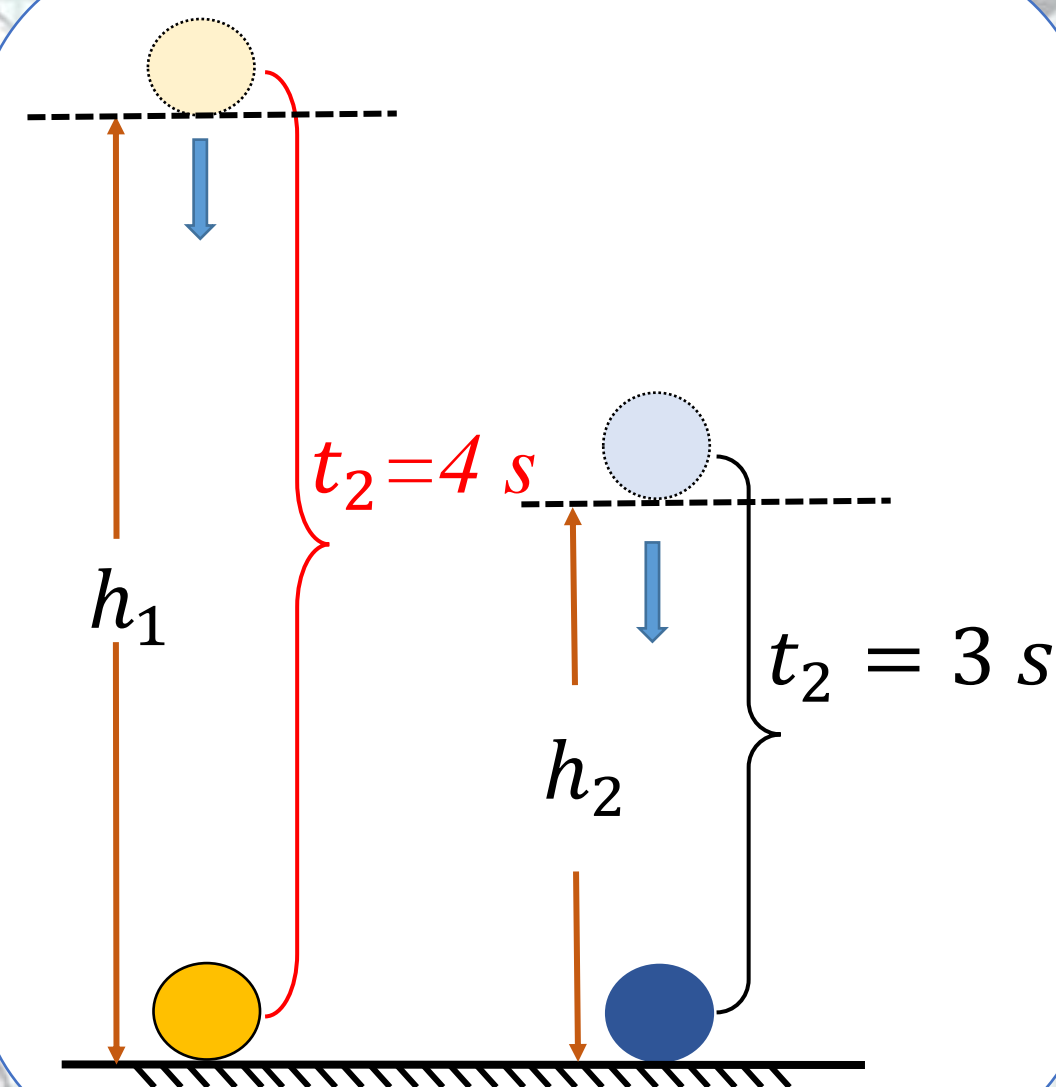
$$t_2 = 4 \text{ s}$$

$$h_1/h_2 = ?$$

**Yechilishi:**

Erkin tushayotgan jismning tushish balandligini boshlang'ich tezlik bo'lmagan holda  $h = \frac{gt^2}{2}$  ifoda orqali topar edik. Har ikkala jismning tushish balandliklari nisbatini olsak, quyidagi korinish hosil bo'ladi:

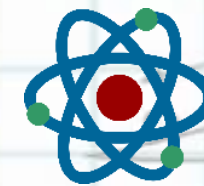
$$\frac{h_1}{h_2} = \frac{t_1^2}{t_2^2} \text{ bu ifodadan } \frac{h_1}{h_2} = \frac{9}{16} \text{ ekani ko'rinib turibdi.}$$







# IT Fizika



Erkin tushayotgan jism 7-sekundda qanday masofani o'tadi (m)?  $g = 10 \text{ m/s}^2$ .

**Berilgan:**

$$n = 7 \text{ s}$$

$$\Delta h_n = ?$$

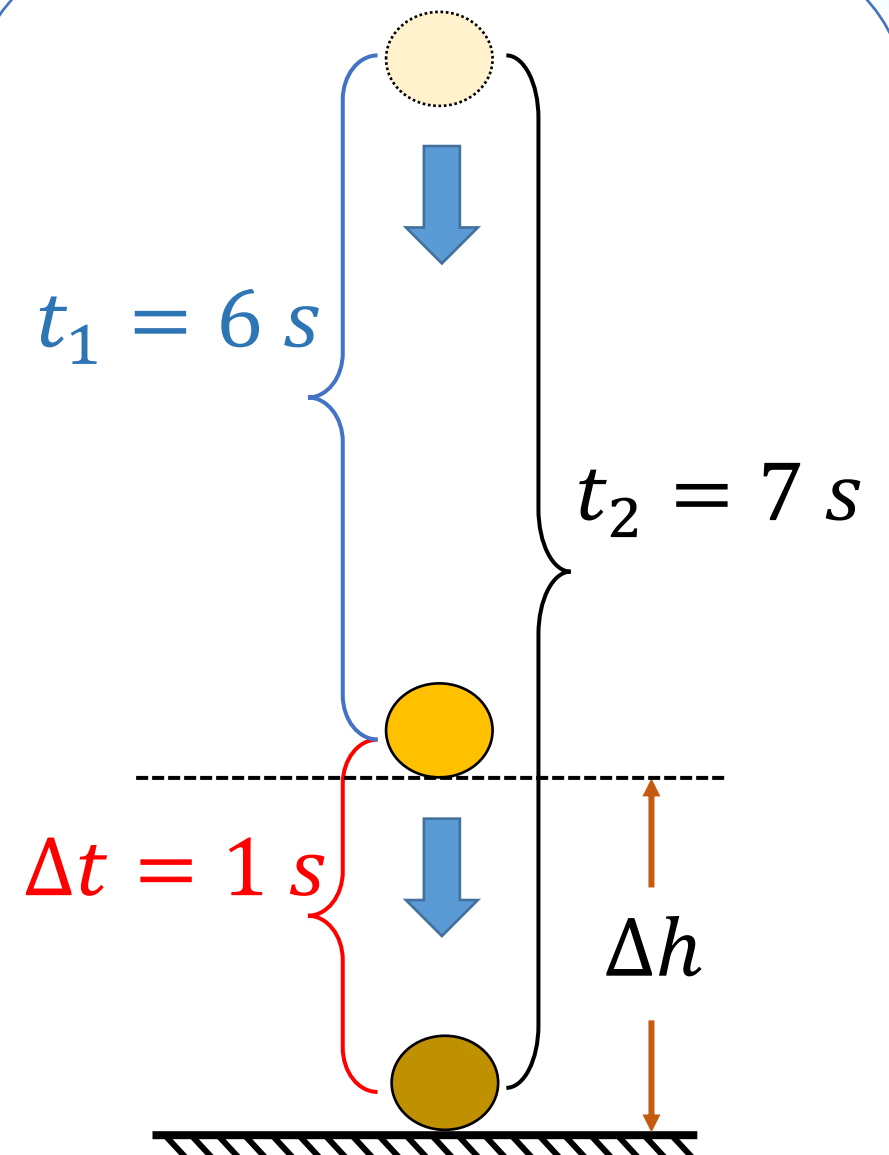
**Yechilishi:**

Bu masalani erkin tushayotgan jismning  $n$ -sekundda bosib o'tgan masofasini topish formulasi orqali yechamiz.

$$\Delta h_n = v_0 + \frac{g}{2} (2n - 1); \quad v_0 = 0 \quad \text{holat uchun}$$

$$\Delta h_n = \frac{g}{2} (2n - 1) \text{ deb yozsak bo'ladi.}$$

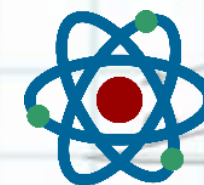
$$\Delta h_n = \frac{10}{2} (2 \cdot 7 - 1) = 65 \text{ m.}$$







# IT Fizika



Erkin tushayotgan jismning  $n$ -sekunddagi ko'chishi qanday (m)?  $g = 10 \text{ m/s}^2$ .

**Berilgan:**

$n$

$\Delta h_n = ?$

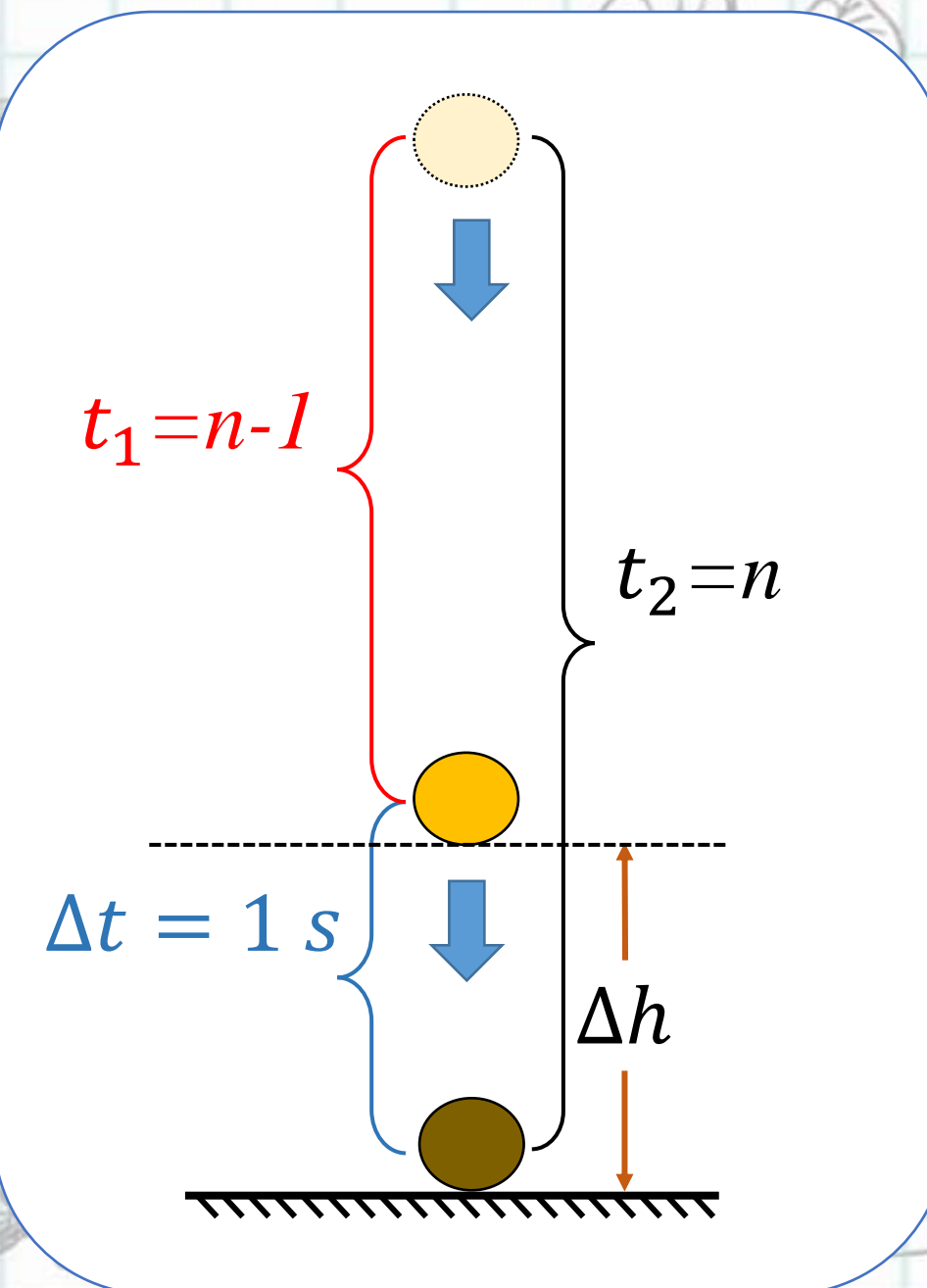
**Yechilishi:**

Bu masalani erkin tushayotgan jismning  $n$ -sekundda bosib o'tgan masofasini topish formulasidan topamiz.

$$\Delta h_n = v_0 + \frac{g}{2}(2n - 1); \quad v_0 = 0 \text{ bo'lganligi uchun}$$

$$\Delta h_n = \frac{g}{2}(2n - 1) \text{ deb yozsak bo'ladi.}$$

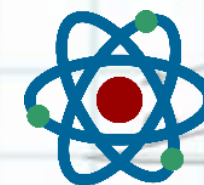
$$\Delta h_n = \frac{10}{2}(2n - 1) = 5(2n - 1)$$







# IT Fizika



Erkin tushayotgan jismning  $(n+1)$  – sekunddagi ko‘chishi qanday?

**Berilgan:**

$n+1$

$\Delta h_n = ?$

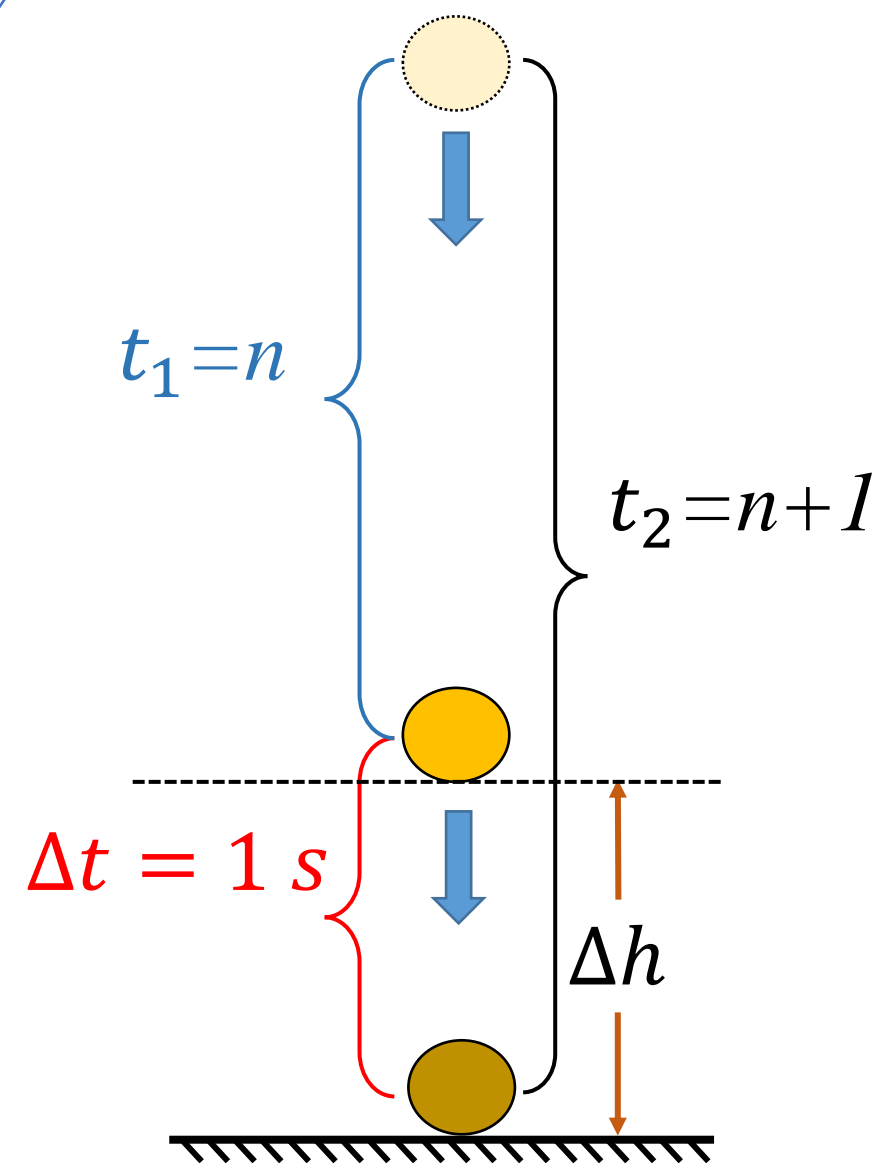
**Yechilishi:**

Bu masalani erkin tushayotgan jismning  $n$ -sekundda bosib o‘tgan masofasini topish formulasidan topamiz.

$$\Delta h_n = v_0 + \frac{g}{2} (2n - 1); \quad v_0 = 0 \text{ ekanidan}$$

$$\Delta h_n = \frac{g}{2} (2n - 1) \text{ deb yozsak bo‘ladi.}$$

$$\Delta h_n = \frac{g}{2} (2(n + 1) - 1) = \frac{g(2n+1)}{2}$$



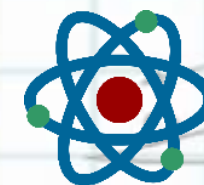




# IT Fizika



MUHAMMAD AL-XORAZMIY NOMIDAGI  
AXBOROT TEXNOLOGIYALARIGA  
IXTISOSLASHTIRILGAN MAKTAB



Ibrohim Fayziyev

Erkin tushishning 3–sekundida o‘tilgan yo‘lning 4–sekundda o‘tilgan yo‘lga nisbati qanday?

**Berilgan:**

$$h_1 = 3 \text{ s}$$

$$h_2 = 4 \text{ s}$$

$$h_1/h_2 = ?$$

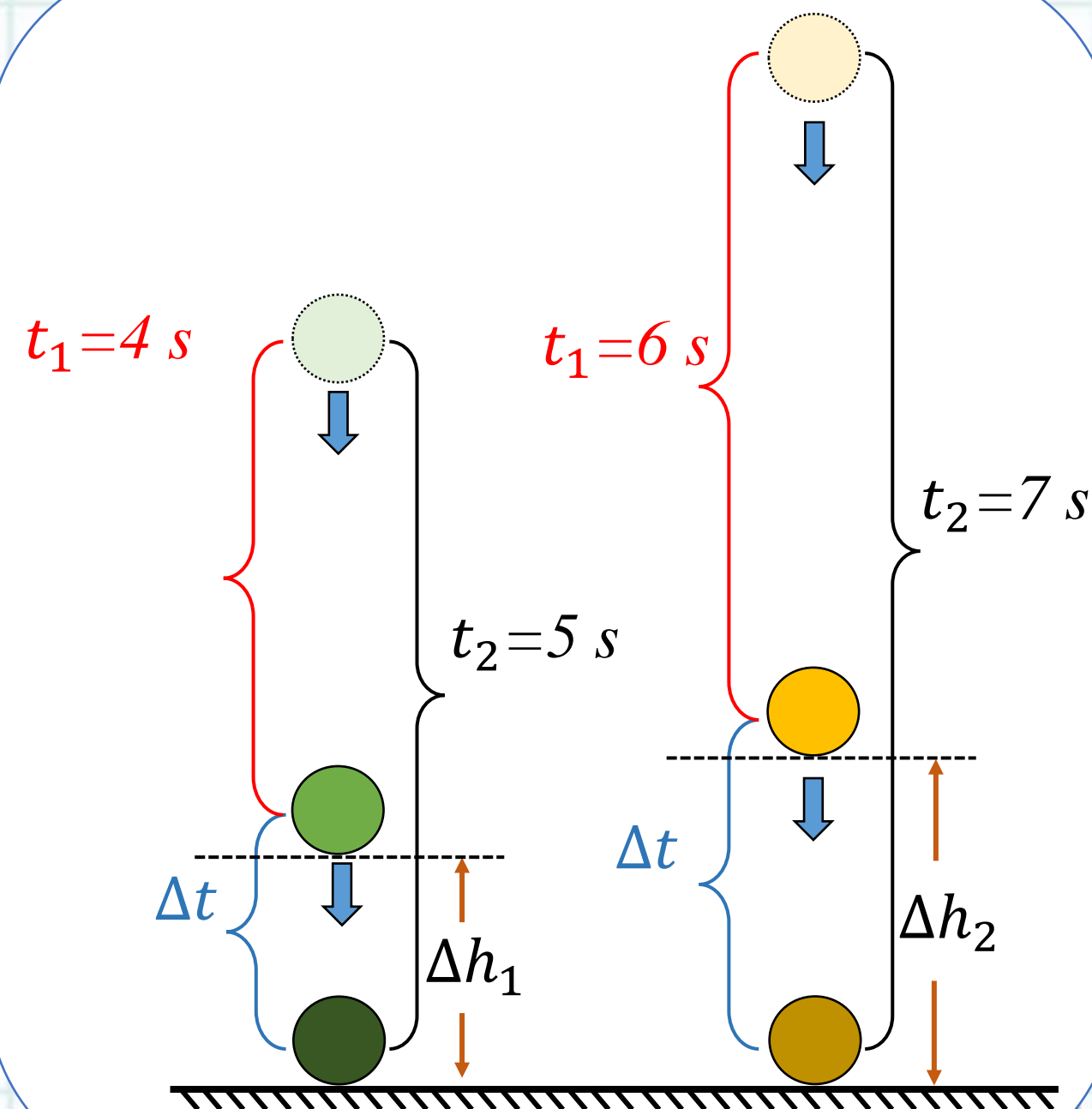
**Yechilishi:**

Erkin tushayotgan jismning  $n$ -sekundda bosib o‘tgan masofasini boshlang‘ich tezlik bo‘lmagan holda

$\Delta h_n = \frac{g}{2}(2n - 1)$  ifoda orqali topar edik.

Har ikkala jismning tushish balandliklari nisbatini olsak, quyidagi korinish hosil bo‘ladi:

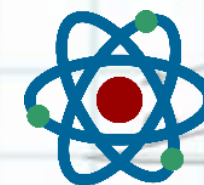
$$\frac{h_1}{h_2} = \frac{2n_1 - 1}{2n_2 - 1} \text{ bu ifodadan } \frac{h_1}{h_2} = \frac{5}{7}$$







# IT Fizika



Biror balandlikdan erkin tushayotgan (boshlang'ich tezliksiz) jism yo'lining birinchi  $1/4$  qismi oxirida  $v$  tezlikka erishgan bo'lsa, yo'l oxiridagi tezligi qanday bo'ladi?

**Berilgan:**

$h/4$ ;  $v$

$h$

$v_1 = ?$

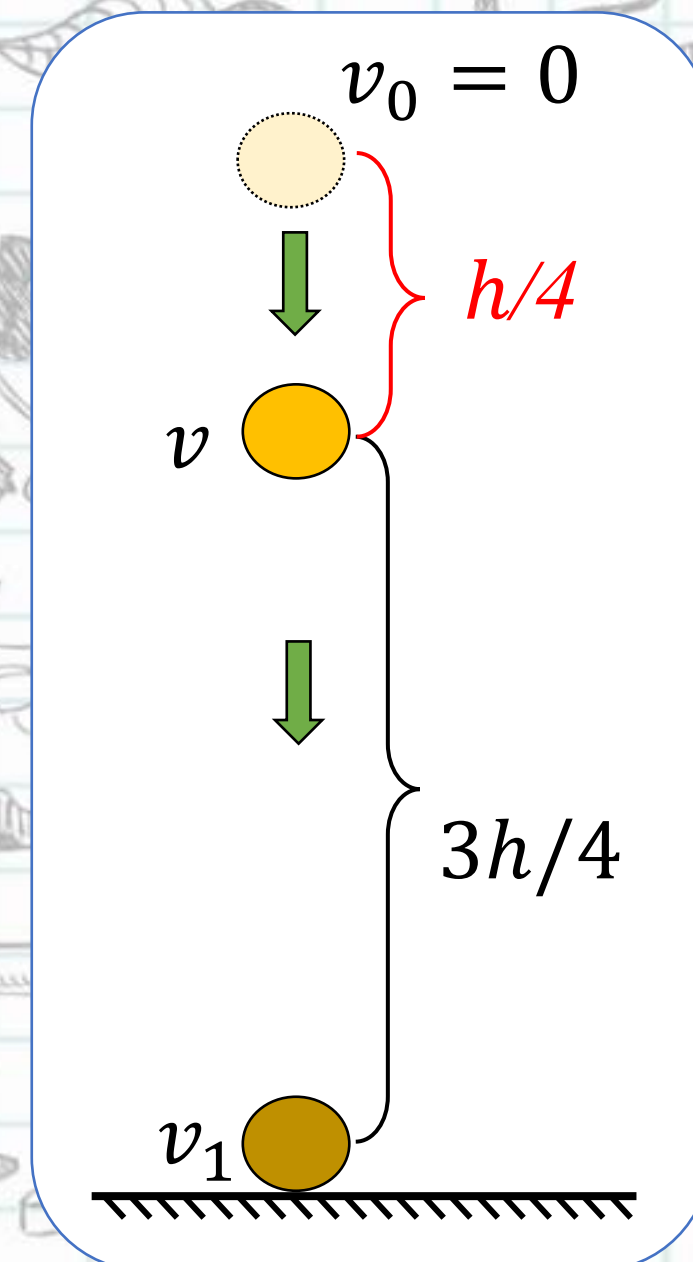
**Yechilishi:**

Bu masalni yechishda dastlab  $h = \frac{v^2 - v_0^2}{2g}$  formula orqali jismni erishgan tezligini balandlikka bog'lanish ifodasini keltirib chiqaramiz.

$\frac{h}{4} = \frac{v^2}{2g} \Rightarrow h = \frac{2v^2}{g}$  bu ifoda jismning tushish balandligi va  $h/4$  balandlikda jism erishgan tezligi orasidagi bog'lanish ifodasi.

Jismni tushish balandligini oxirgi tezligi bilan bog'lasak quyidagicha

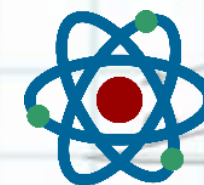
bo'ladi:  $h = \frac{v_1^2}{2g}$  bu ifodalarni tenglashtiramiz!  $\frac{2v^2}{g} = \frac{v_1^2}{2g} \Rightarrow v_1 = 2v$







# IT Fizika



Jism 45 m balandlikdan erkin tushmoqda. Tushishning oxirgi sekundidagi ko'chishi qanday (m)?

**Berilgan:**

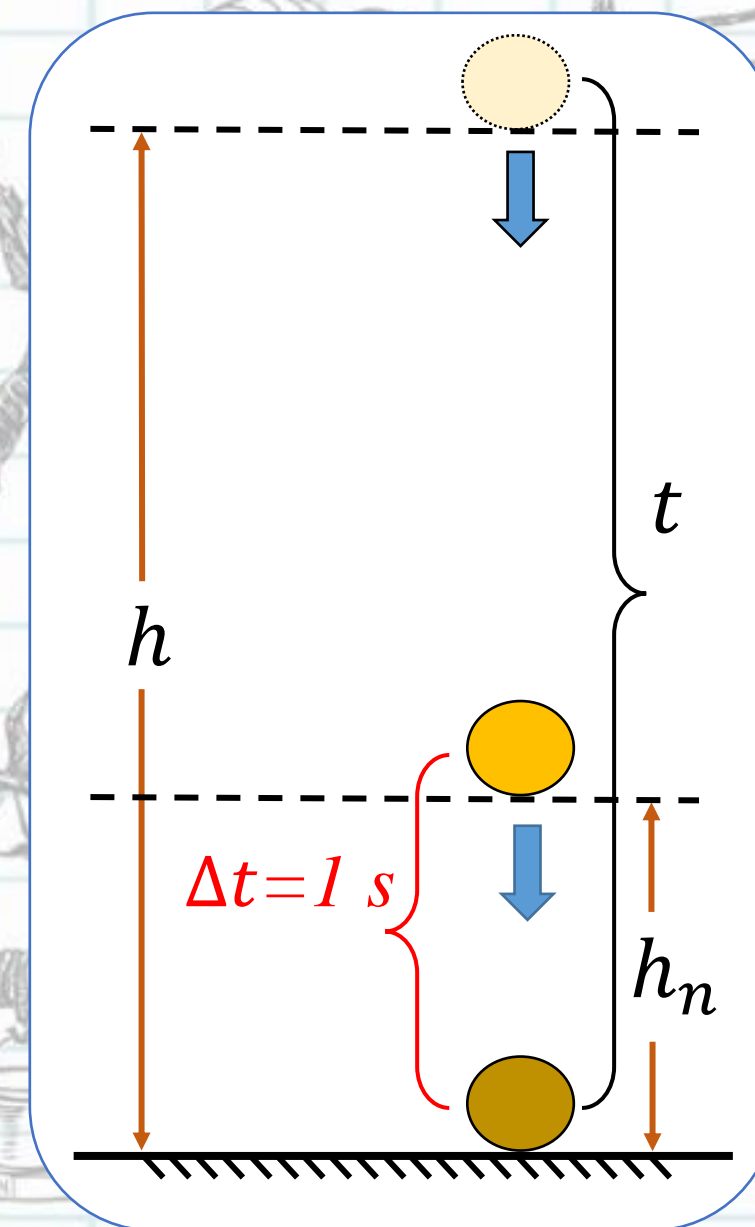
$$h = 45 \text{ m}$$
$$h_n = ?$$

**Yechilishi:**

Bu masalani quyidagi formuladan topamiz.  $h_n = v_0 + \frac{g}{2}(2n - 1)$   
Ammo biz bu jismni qancha vaqtda erga tushgani bilmaymiz, shuning uchun  $t = \sqrt{\frac{2h}{g}}$  formula orqali topib olamiz.  $t = \sqrt{\frac{2 \cdot 45}{10}} = 3 \text{ s}$  demak biz jismni 3- sekundda bosib o'tgan balandligini topishimiz kerak ekan.

$$v_0 = 0 \Rightarrow \Delta h_n = \frac{g}{2}(2n - 1) \text{ deb yozsak bo'ladi.}$$

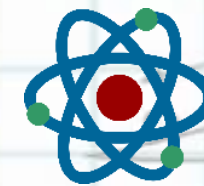
$$\Delta h_n = \frac{10}{2}(2 \cdot 3 - 1) = 25 \text{ m.}$$







# IT Fizika



500 m li televizion minoraning uchidan 1 s farq bilan uzilgan ikki tomchi orasidagi masofa ko'pi bilan necha metr bo'ladi?

## Berilgan:

$$h = 500 \text{ m}$$

$$h_n = ?$$

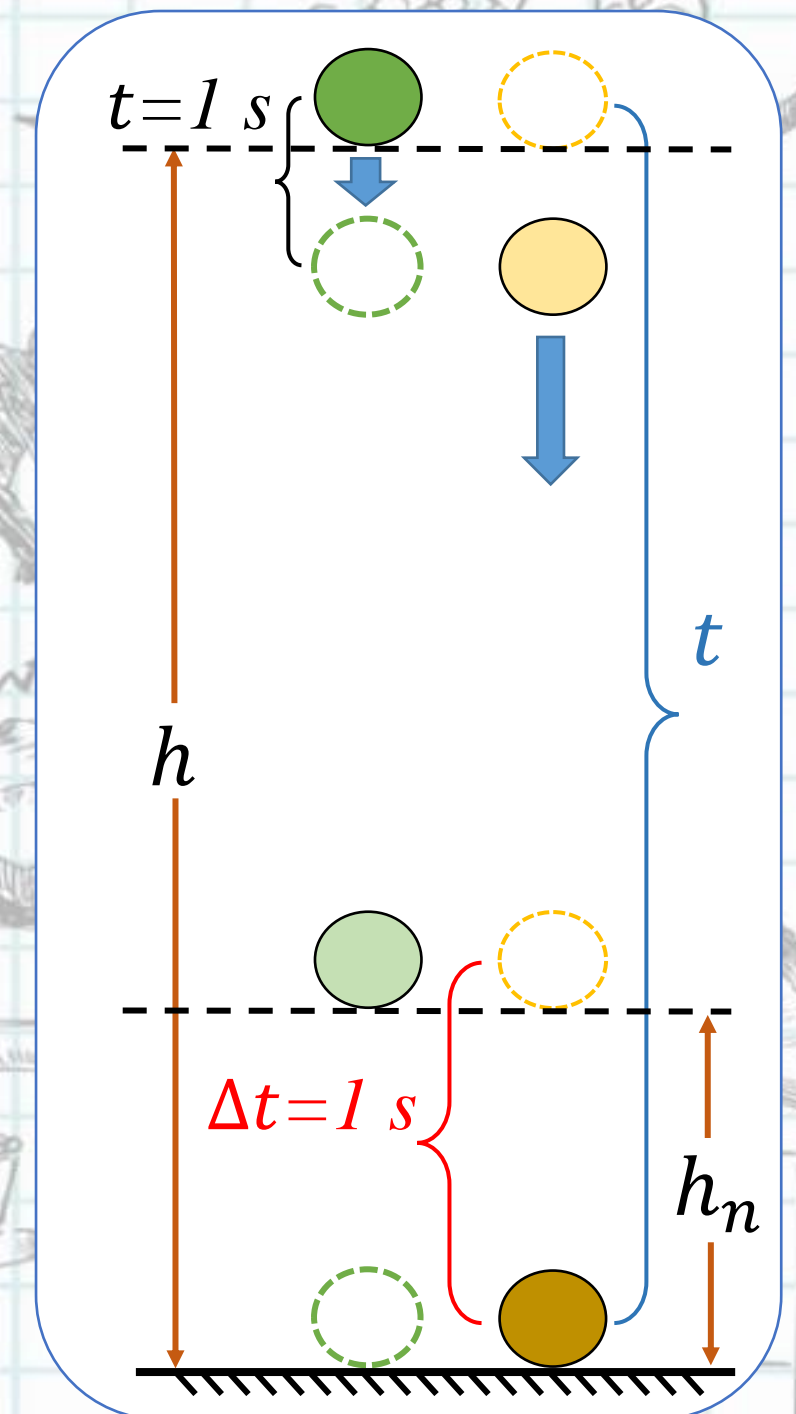
## Yechilishi:

Bir sekund oralatib tashlangan jismlar orasidagi eng katta masofa birinchi jismni oxirgi sekundda bosib o'tgan yo'lga teng bo'ladi.

$h_n = v_0 + \frac{g}{2}(2n - 1)$ . Ammo biz bu jismni qancha vaqtda erga tushgani bilmaymiz, shuning uchun  $t = \sqrt{\frac{2h}{g}}$  formula orqali topib olamiz.

$t = \sqrt{\frac{2 \cdot 500}{10}} = 10 \text{ s}$ . demak biz jismni 10 - sekundda boib o'tgan balandligini topishimiz kerak ekan.  $v_0 = 0 \Rightarrow h_n = \frac{g}{2}(2n - 1)$

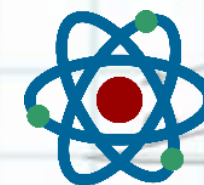
$$h_n = \frac{10}{2}(2 \cdot 10 - 1) = 95 \text{ m}.$$







# IT Fizika



Jism  $H$  balandlikdan boshlang'ich tezliksiz tushmoqda. U harakatining oxirgi sekundida  $3H/4$  ga teng yo'l o'tadi.  $H$  qanday (m)?  $g=10 \text{ m/s}^2$ .

**Berilgan:**

$$h_n = 3H/4$$

$$\Delta t = 1 \text{ s}$$

$$H = ?$$

**Yechilishi:**

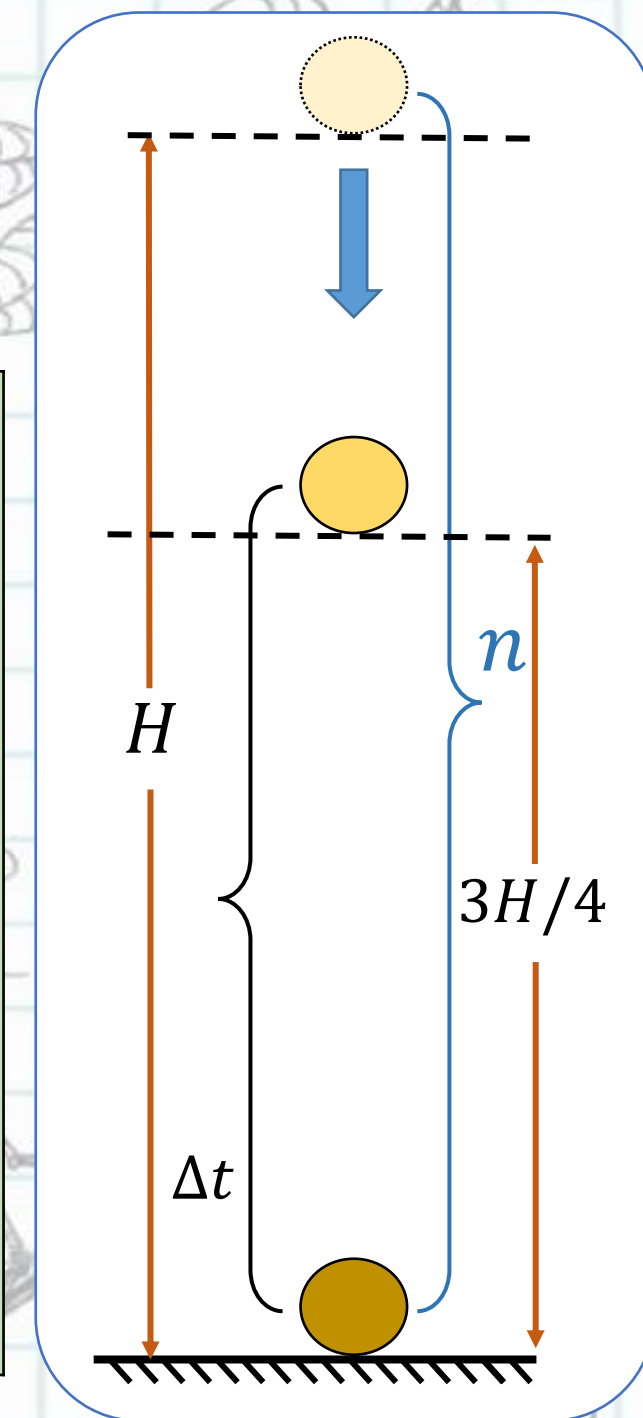
Jismni oxirgi sekundda bosib o'tgan balandligi ifodasidan

$h_n = \frac{g}{2}(2n - 1)$  jismni qancha vaqtda erga tushganini bilib olamiz va  $H = \frac{gt^2}{2}$  formula orqali jismni tushgan balandligini topib olamiz! Jismni qancha vaqtda erga tushganini topish uchun

$$\begin{cases} h_n = \frac{3H}{4} \\ h_n = \frac{g}{2}(2n - 1) \end{cases} \Rightarrow \frac{g}{2}(2n - 1) = \frac{3H}{4} \Rightarrow n = \frac{3H + 20}{40} \Rightarrow H = \frac{g \left( \frac{3H + 20}{40} \right)^2}{2}$$

bu ifodani soddalashtirsak  $9H^2 - 200H + 400 = 0$

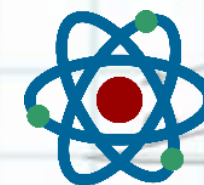
kvadrat tenglama keib chiqadi, yechimi esa  $H=20 \text{ m}$  ekni ko'ramiz.







# IT Fizika



$H$  balandlikdan boshlang'ich tezliksiz tushayotgan jism harakat vaqtining oxirgi sekundida  $3H/4$  masofani o'tdi. U necha sekund tushgan?

**Berilgan:**

$$h_n = 3H/4$$

$$\Delta t = 1 \text{ s}$$

$$t = ?$$

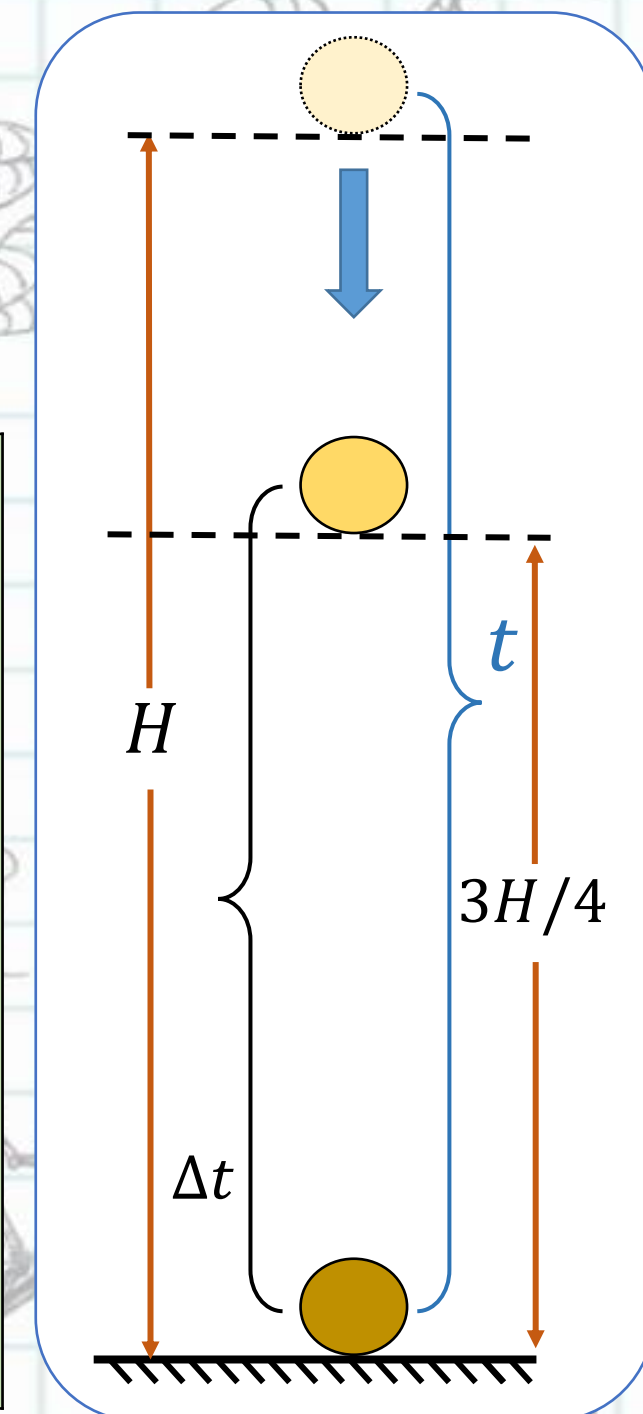
**Yechilishi:**

Jismni oxirgi sekundda bosib o'tgan balandligi ifodasidan

$h_n = \frac{g}{2}(2n - 1)$  jismni qancha vaqtda erga tushganini bilib olamiz va  $H = \frac{gt^2}{2}$  formula orqali jismni tushgan balandligini topib olamiz! Jismni qancha vaqtda erga tushganini topish uchun

$$\begin{cases} h_n = \frac{3H}{4} \\ h_n = \frac{g}{2}(2n - 1) \end{cases} \Rightarrow \frac{g}{2}(2n - 1) = \frac{3H}{4} \Rightarrow n = \frac{3H + 20}{40} \Rightarrow H = \frac{g \left( \frac{3H + 20}{40} \right)^2}{2}$$

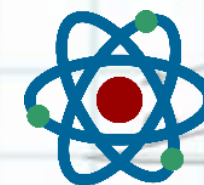
Bu yerdan esa  $H = 20$  m ekni ko'ramiz.  $t = \sqrt{\frac{2h}{g}} = \sqrt{\frac{2 \cdot 20}{10}} = 2 \text{ s.}$







# IT Fizika



Jism 180 m balandlikdan boshlang'ich tezliksiz erkin tushmoqda. Jismning oxirgi sekunddagi ko'chishi birinchi sekunddagi ko'chishidan necha marta ortiq?  $g=10 \text{ m/s}^2$ .

**Berilgan:**

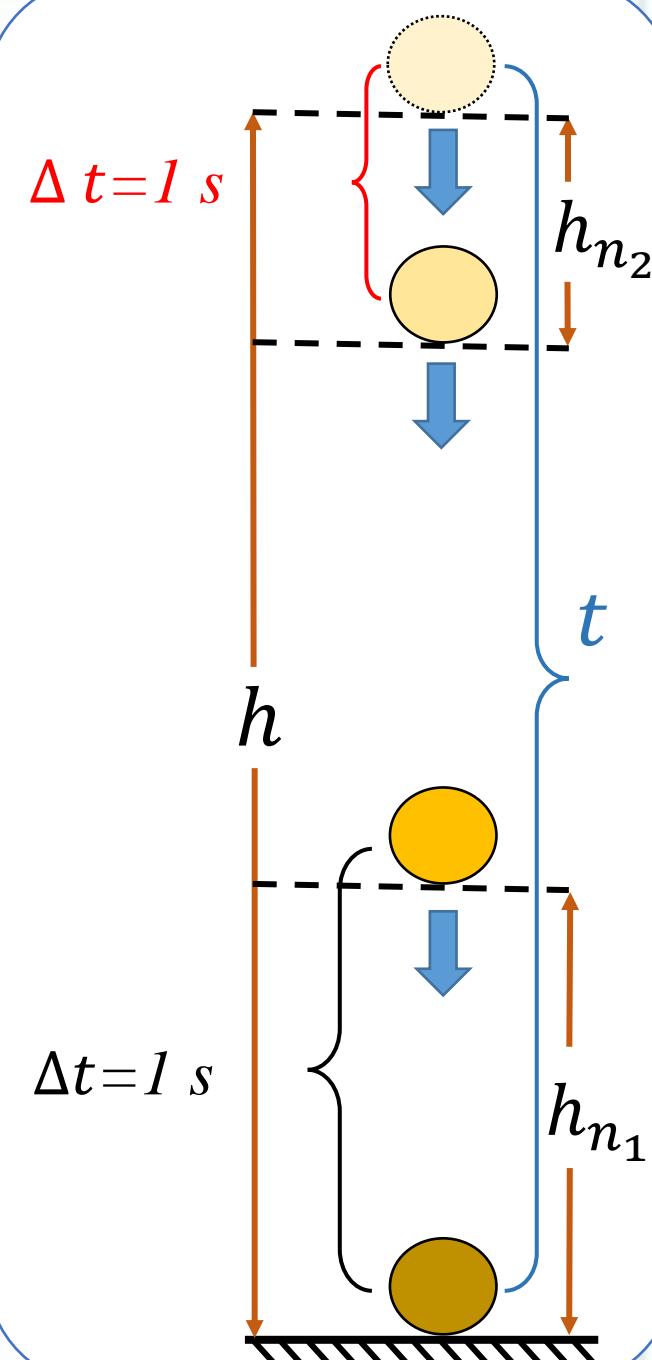
$$h=180\text{m}$$

$$h_{n_1}/h_{n_2}=?$$

**Yechilishi:**

$h_n = v_0 + \frac{g}{2}(2n - 1)$  Ammo biz bu jismni qancha vaqtda erga tushgani, shuning uchun bu jismni qancha vaqtda erga tushganini  $t = \sqrt{\frac{2h}{g}} = \sqrt{\frac{2 \cdot 180}{10}} = 6 \text{ s}$  demak biz jismni 6- sekundda boib o'tgan balandligini topishimiz kerak ekan.  $v_0 = 0 \Rightarrow h_n = \frac{g}{2}(2n - 1)$  deb yozsak bo'ladi.

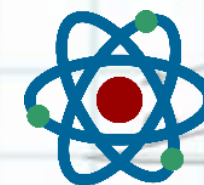
$$h_{n_1} = \frac{10}{2}(2 \cdot 6 - 1) = 55 \text{ m.} \quad h_{n_2} = \frac{10}{2}(2 \cdot 1 - 1) = 5 \text{ m.} \quad \frac{h_{n_1}}{h_{n_2}} = 11$$







# IT Fizika



Boshlang'ich tezliksiz erkin tushayotgan jism oxirgi 35 metrni 1 s davomida o'tdi. Tushish balandligi qanday (m).

## Berilgan:

$$h_n = 35 \text{ m}$$

$$\Delta t = 1 \text{ s}$$

$$h = ?$$

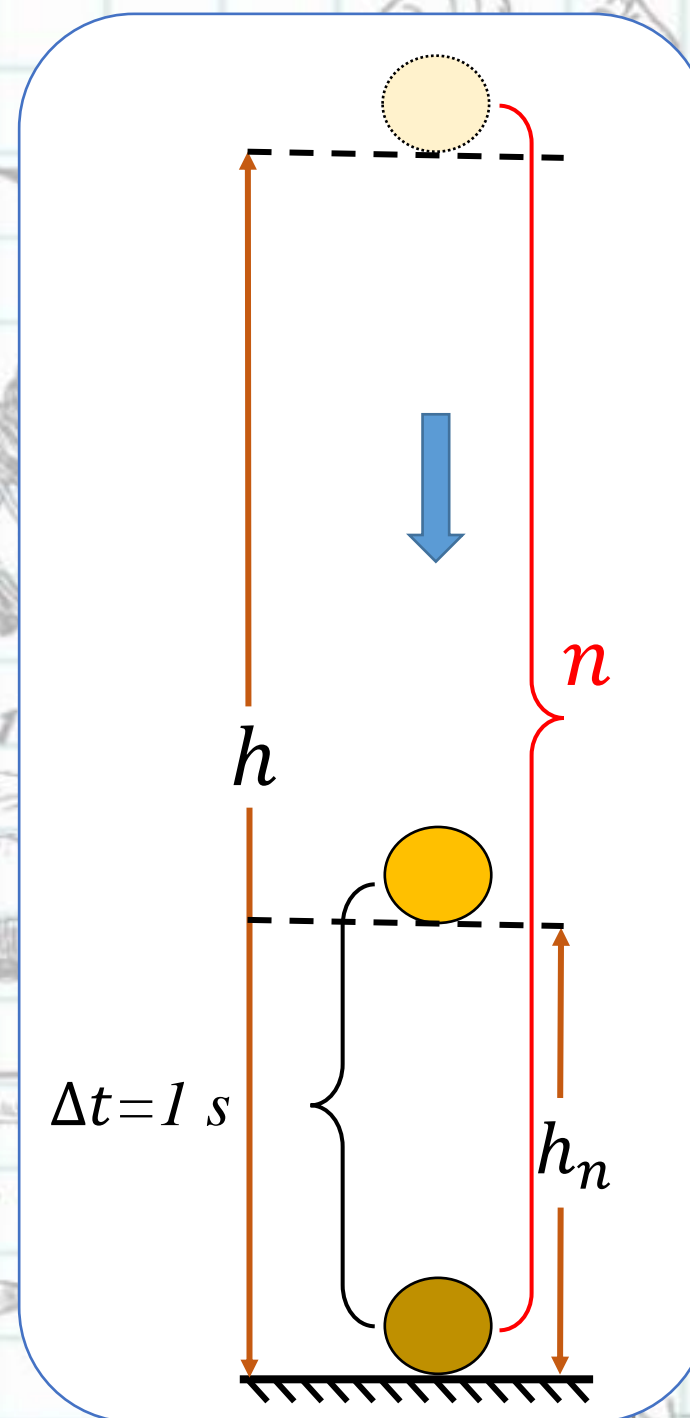
## Yechilishi:

Jism oxirgi 1 sekundda bosib o'tgan yo'li oxirgi sekundda bosib o'tgan balandligi  $h_n$  ekanini bilgan holda oldin jismni qancha vaqtda erga tushganini  $h_n = \frac{g}{2}(2n - 1)$  formula orqali aniqlaymiz va  $h = \frac{gt^2}{2}$  formula orqali jismni tushgan balandligini topib olamiz.

$$h_n = \frac{g}{2}(2n - 1) \Rightarrow n = \frac{2h_n + g}{2g}$$

$$n = \frac{2 \cdot 35 + 10}{20} = 4 \text{ s},$$

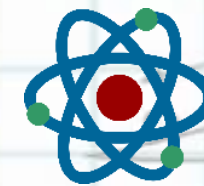
$$h = \frac{10 \cdot 4^2}{2} = 80 \text{ m}.$$







# IT Fizika



Erkin tushayotgan jism oxirgi 2 sekundda 160 m masofani o'tgan bo'lsa, u qancha vaqt tushgan (s)?  $g = 10 \text{ m/s}^2$ .

## Berilgan:

$$h = 160 \text{ m}$$

$$t = 2 \text{ s}$$

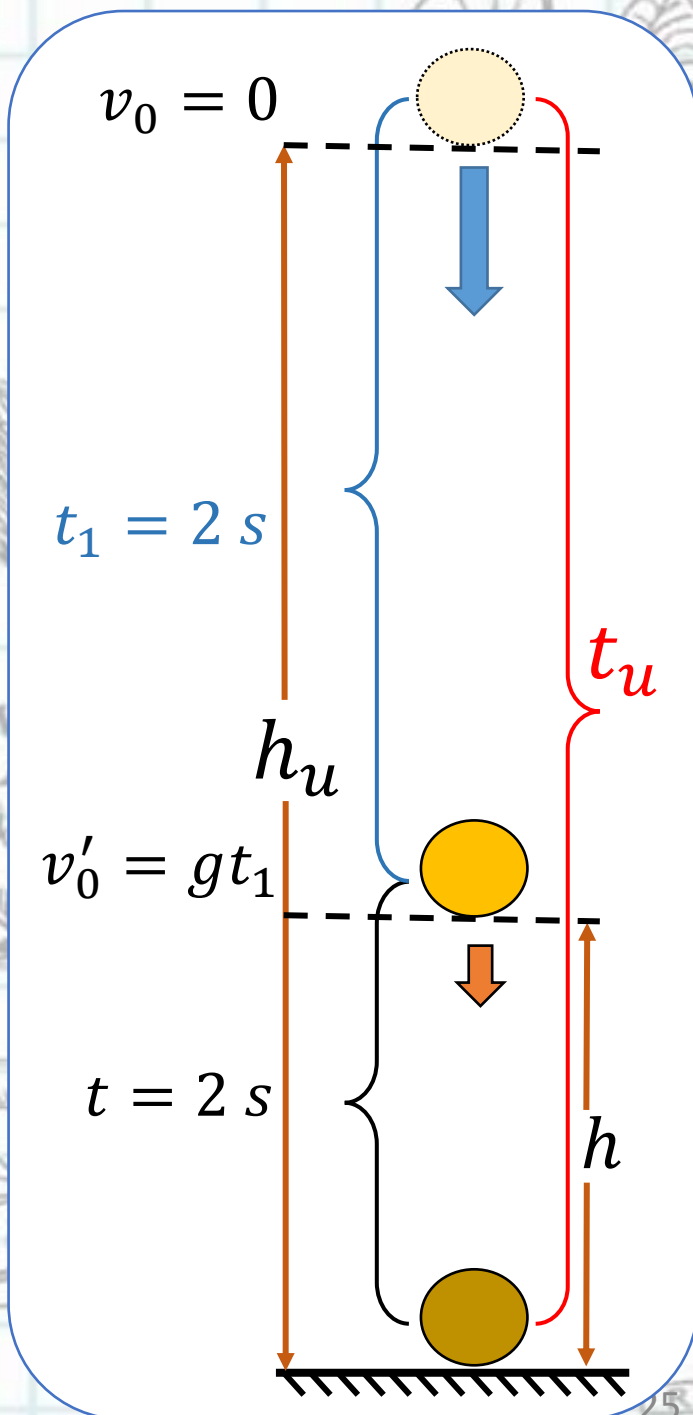
$$t_u = ?$$

## Yechilishi:

Erkin tushayotgan jismning ohirgi 2 sekunda ko'chishu topish uchun quyidagin yozamiz  $h = v'_0 t + \frac{gt^2}{2}$ . Bu yerda  $v'_0 = gt_1$  manshu ikki tenglamadan  $h = gt_1 t + \frac{gt^2}{2}$  hosil qilamiz. Bundan

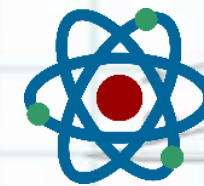
$$t_1 = \frac{2h - gt^2}{2gt} \text{ kelib chiqadi. } t_1 = \frac{2 \cdot 160 - 10 \cdot 2^2}{2 \cdot 10 \cdot 2} = 7 \text{ s.}$$

$$t_u = t + t_1 \quad t_u = 2 + 7 = 9 \text{ s}$$





# IT Fizika



35 m balandlikdan boshlang'ich tezliksiz erkin tushayotgan jismning tezligi 10 m/s bo'lganda, u erdan qanday (m) balandlikda bo'ladi?

## Berilgan:

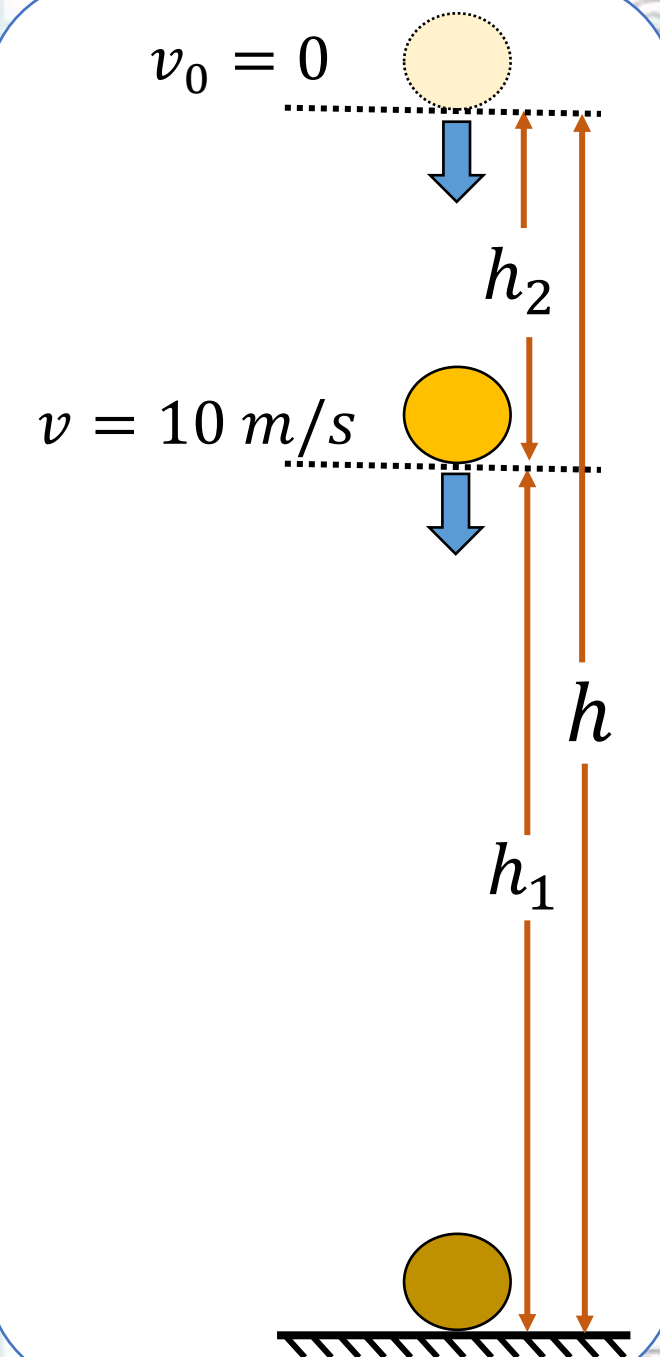
$h = 35 \text{ m}$   
 $v = 10 \text{ m/s}$   
 $h_1 = ?$

## Yechilishi:

Bu masalada biz  $h_2$  balandlikni topolsak  $h_1 + h_2 = h$  eknidan foydalanib  $h_1$  balandlikni topamiz.  $h_2$  balandlikni  $h_2 = \frac{v^2}{2g}$  formuladan topamiz.

$$h_2 = \frac{10^2}{2 \cdot 10} = 5 \text{ m.}$$

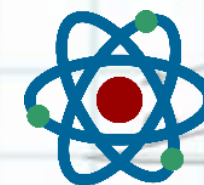
$$h_1 + h_2 = h \Rightarrow h_1 = h - h_2$$
$$h_1 = 35 - 5 = 30 \text{ m.}$$







# IT Fizika



Jism  $h=45$  m balandlikdan erkin tushmoqda. Uning tezligi  $10$  m/s ga etganda u erdan qanday (m) balandlikda bo'ladi?  $g=10$  m/s<sup>2</sup>.

## Berilgan:

$$h = 45 \text{ m}$$

$$v = 10 \text{ m/s}$$

$$h_1 = ?$$

## Yechilishi:

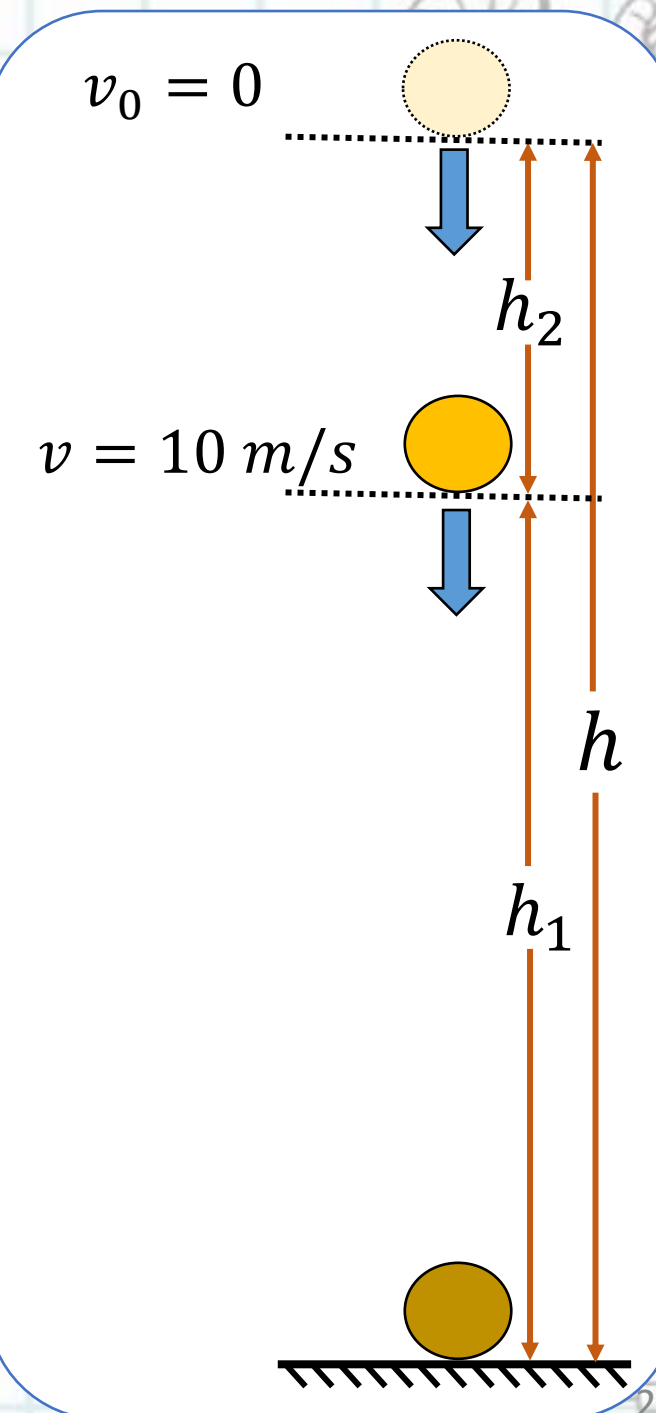
Bu masalada biz  $h_2$  balandlikni topolsak  $h_1 + h_2 = h$  eknidan foydalanib  $h_1$  balandlikni topamiz.

$h_2$  balandlikni  $h_2 = \frac{v^2}{2g}$  formuladan topamiz.

$$h_2 = \frac{10^2}{2 \cdot 10} = 5 \text{ m.}$$

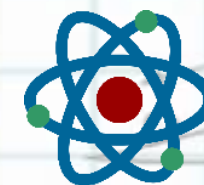
$$h_1 + h_2 = h \Rightarrow h_1 = h - h_2$$

$$h_1 = 45 - 5 = 40 \text{ m.}$$





# IT Fizika



Ikkinchi tomchi uzilgandan 2 s o'tgach tomchilar orasidagi masofa 25 m ga teng bo'lgan bo'lsa, tomchilar necha sekund vaqt intervali bilan uzilgan?

## Berilgan:

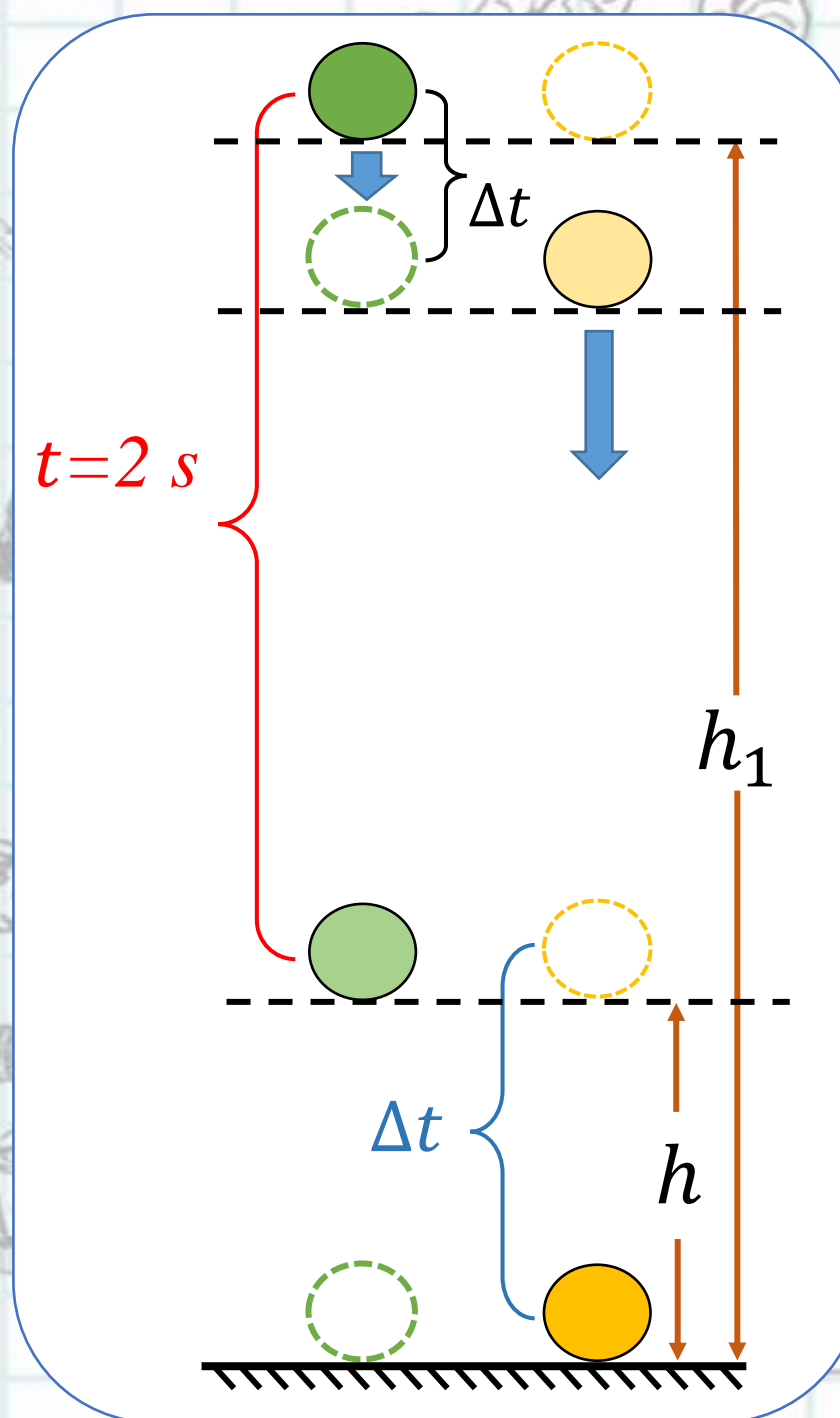
$t = 2 \text{ s}$   
 $h = 25 \text{ m}$   
 $\Delta t = ?$

## Yechilishi:

Bu holda 1- va 2- tomchilarning tushgan balandliklari ayirmasi  $h=25 \text{ m}$  ekanidan foydalanamiz. 2-jism  $t=2 \text{ s}$  harakatlangan, 1- jism esa  $t+\Delta t$  vaqt harakatda bo'ldi.

$$h_1 - h_2 = h \quad \frac{g(t + \Delta t)^2}{2} - \frac{gt^2}{2} = h$$

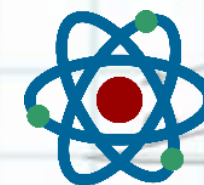
Ushbu tenglamani yechsak  $\Delta t = 1 \text{ s}$  ekani kelib chiqadi.







# IT Fizika



Bir xil balandlikdan 2 s vaqt intervali bilan ikkita jism erkin tusha boshladi. 2-jism tusha boshlagandan necha sekund o'tgach ular orasidagi masofa 40 m bo'ladi?

## Berilgan:

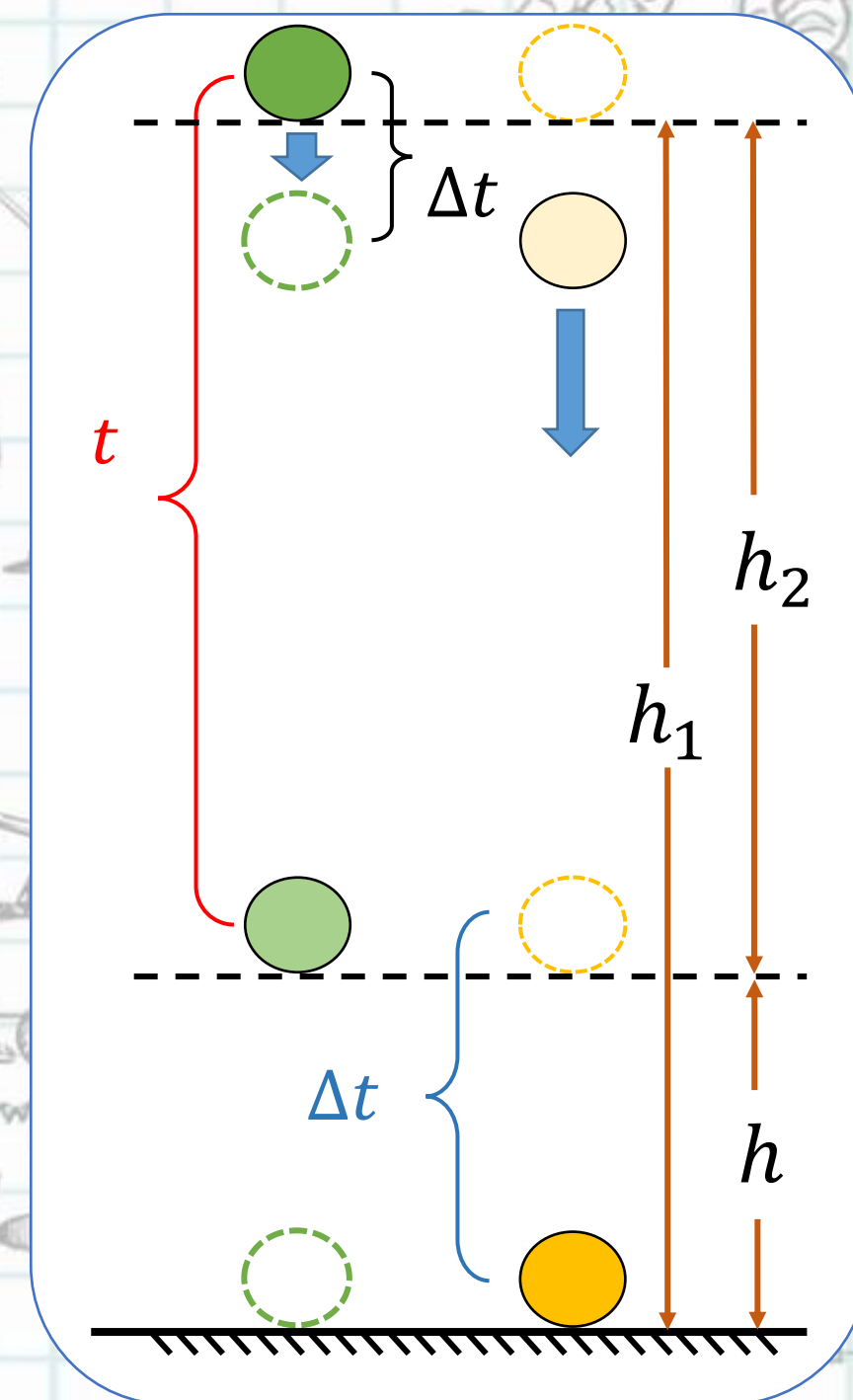
$\Delta t = 2 \text{ s}$   
 $h = 40 \text{ m}$   
 $t = ?$

## Yechilishi:

Bu holda 1- va 2- tomchilarning tushgan balandliklari ayirmasi  $h=40 \text{ m}$  ekanidan foydalanamiz. 2-jism  $t$  vaqt harakatlangan, 1- jism esa  $t+\Delta t$  vaqt harakatlangan.

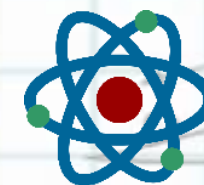
$$h_1 - h_2 = h; \quad \frac{g(t + \Delta t)^2}{2} - \frac{gt^2}{2} = h$$

Ushbu tenglamani echsak  $t = 1 \text{ s}$  ekani kelib chiqadi.





# IT Fizika



Boshlang'ich tezliksiz erkin tushayotgan jismning biror balandlikdagi tezligi 20 m/s bo'lsa, undan 25 m pastda joylashgan nuqtadagi tezligi qanday (m/s) bo'ladi?

## Berilgan:

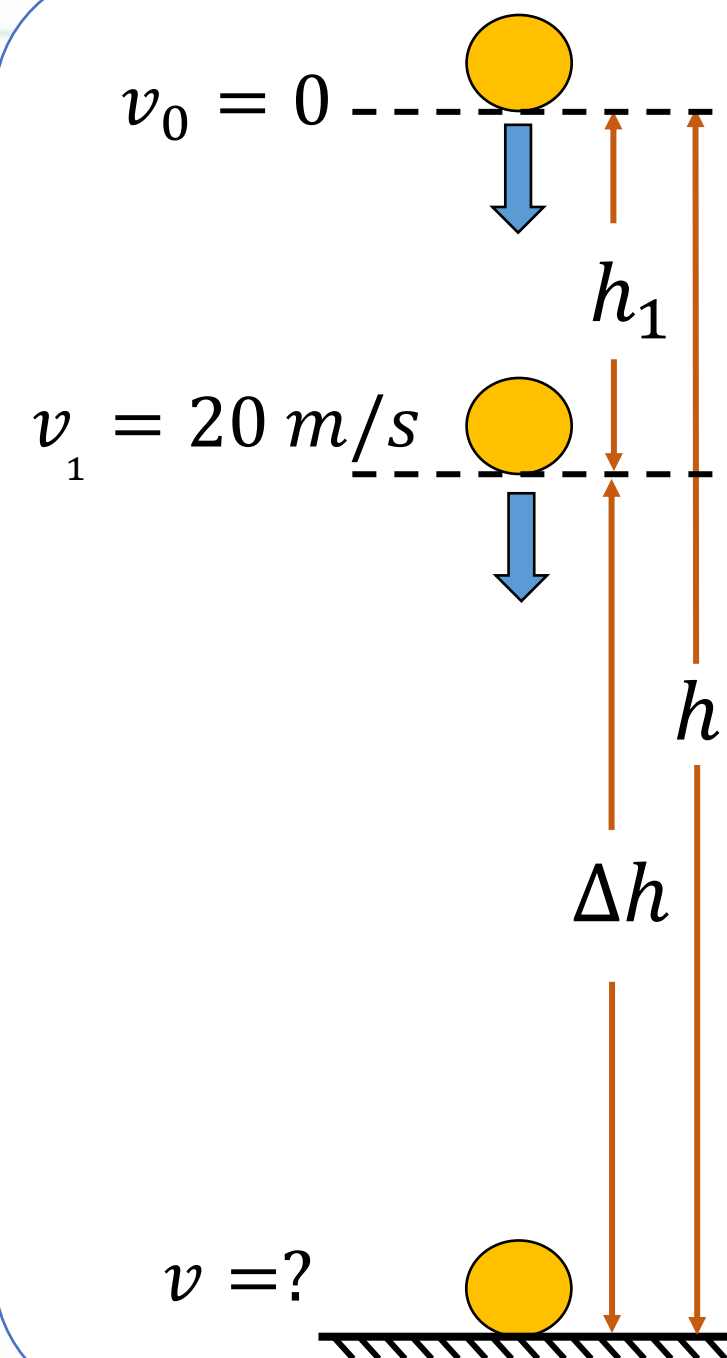
$$v_1 = 20 \text{ m/s}$$
$$\Delta h = 25 \text{ m}$$
$$v = ?$$

## Yechilishi:

Erkin tushayotgan jismning tezlig va tushish balandligi orasidagi bog'lanish quydagicha.  $h_1 = \frac{v_1^2}{2g} = \frac{20^2}{20} = 20 \text{ m}$

Umumiy balandlik  $h = h_1 + \Delta h = 20 + 25 = 45$

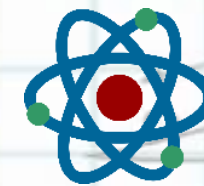
25 m masofadan kegingi tezligi  $v = \sqrt{2gh} = \sqrt{2 \cdot 10 \cdot 45} = 30 \text{ m/s}$







# IT Fizika



Balandligi 20 m bo'lgan binodan tushayotgan jismning boshlang'ich tezligi 15 m/s. yerga tushish paytida uning tezligi qanday bo'ladi (m/s)?  $g=10 \text{ m/s}^2$ .

## Berilgan:

$$h = 20 \text{ m}$$

$$v_0 = 15 \text{ m/s}$$

$$v = ?$$

## Yechilishi:

Bu masalni  $h = \frac{v^2 - v_0^2}{2g}$  formula orqali yechamiz.

Bu formuladan jismning erga tushgandagi tezligi  $v$  ni topamiz:

$$v = \sqrt{v_0^2 + 2gh}, \quad v = \sqrt{15^2 + 2 \cdot 10 \cdot 20} = 25 \text{ m/s}.$$

$$v_0 = 15 \text{ m/s}$$

$$v = ?$$