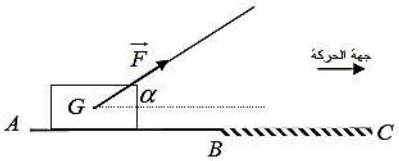
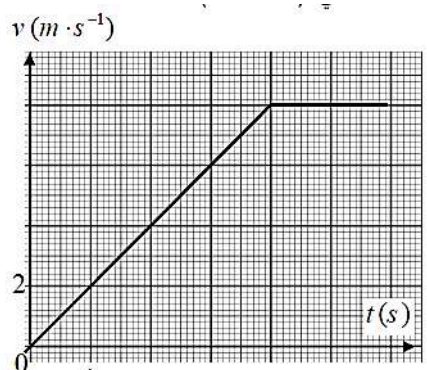
$\alpha = 30°$ $\vec{F}$ $G$ $(AC)$ $m = 10kg$

$t$ $G$ $(BC)$ $(AB)$



الشكل-2



الشكل-3

$G$ -

$AC$

$\vec{F}$ -

$\vec{f}$

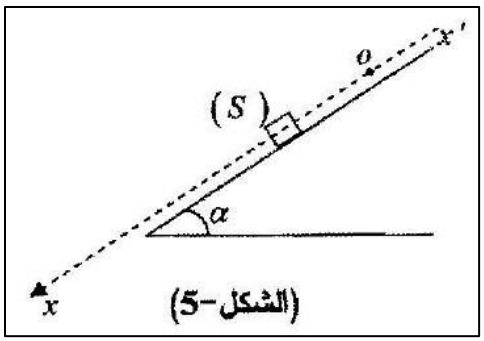
$\overrightarrow{xx'}$ $\alpha = 20°$ $m = 100g$ $(S)$

*Aviméca*

| $t(s)$ | 0 | 0.04 | 0.06 | 0.08 | 0.1 | 0.12 |
|---|---|---|---|---|---|---|
| $v(m/s)$ | $v_0$ | 0.16 | 0.20 | 0.24 | 0.28 | 0.32 |

$v = f(t)$ -

-



(الشكل-5)

$a$ $(S)$ -

$t = 0$ $v_0$ -

$t_2 = 0.08s$ $t_1 = 0.04s$ -

-

$a_0$ -

$a$ $a_0$ -

$\vec{f}$ -

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$g = 10m/s^2$

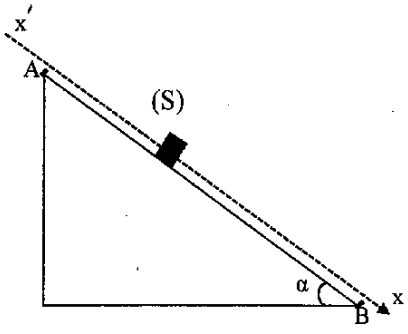
$\alpha = 35°$ $AB$ $m = 900g$ $(S)$

$A$

$AB$

| | $G_0$ | $G_1$ | $G_2$ | $G_3$ | $G_4$ | $G_5$ | $G_6$ | $G_7$ | $G_8$ |
|---|---|---|---|---|---|---|---|---|---|
| $t(s)$ | 0.00 | 0.08 | 0.16 | 0.24 | 0.32 | 0.40 | 0.48 | 0.56 | 0.64 |
| $x(cm)$ | 0.0 | 1.5 | 6.0 | 13.5 | 24.0 | 37.5 | 54.0 | 73.5 | 96.0 |

$\tau = 80ms$ $B$ $G_8$ $A$ $G_0$




$G_6$ $G_5$ $G_4$ $G_3$ $G_2$ -1

$G_5$ $G_4$ $G_3$

$(S)$ -2

$(S)$ -

-

$a$

$\vec{f}$ -3

$\vec{f}$ -

$B$ -

$\alpha$ $AB$ $m = 500g$ $(S)$

$f = 0.5N$ $(S)$

$B$ $v_0$ $A$ $\alpha$

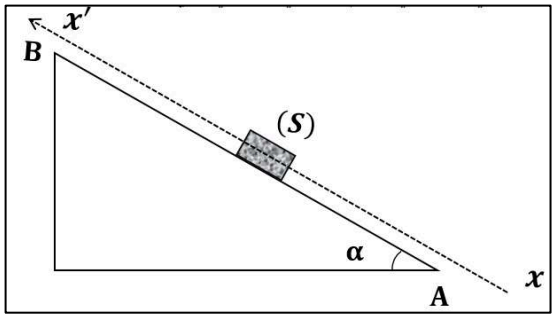
$AB$

| | $G_0$ | $G_1$ | $G_2$ | $G_3$ | $G_4$ | $G_5$ | $G_6$ | $G_7$ |
|---|---|---|---|---|---|---|---|---|
| $t(s)$ | 0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 |
| $x(m)$ | 0 | 0.47 | 0.88 | 1.23 | 1.52 | 1.75 | 1.92 | 2.03 |
| $v(m/s)$ | | | | | | | | |
| $v^2(m/s)^2$ | | | | | | | | |

$\tau = 100ms$ $A$ $G_0$

-1

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$v^2 = f(x)$

$(S)$ -2

$(S)$ -

-

$a$

-

$x$ $v^2$ -

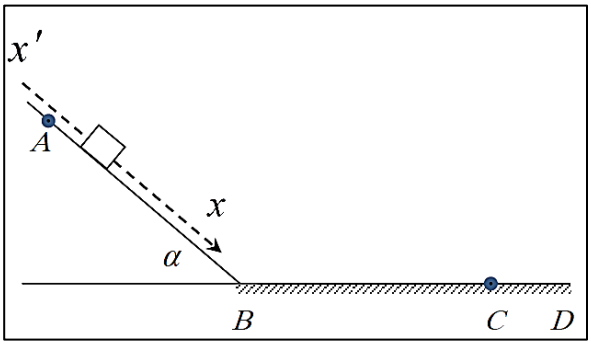
2 -3

$v_0$ -

$AB$ -

$g = 10m/s^2$ α -

$v_B$ α $m = 800g$




$B$ $A$

$v = f(t)$

$g = 10\,m/s^2$

(

$v_B$ (

$AB$ (

(

(

α (

$B$ (

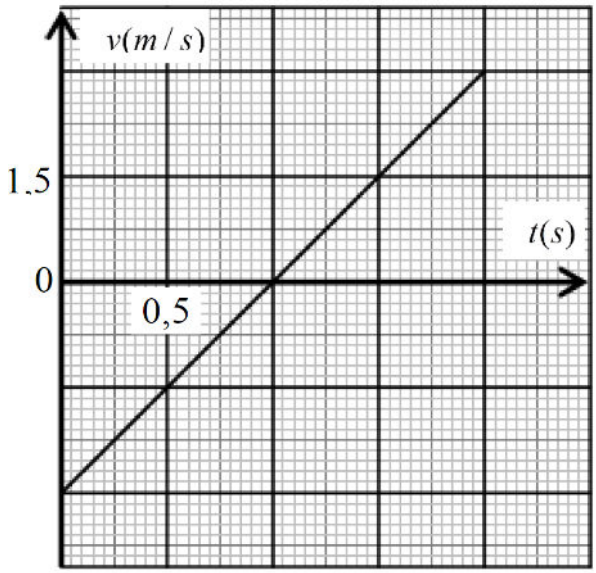
$BD$ $B$ (

$1.8m$ $B$ $C$

$BD$ (

$D$ $B$ (

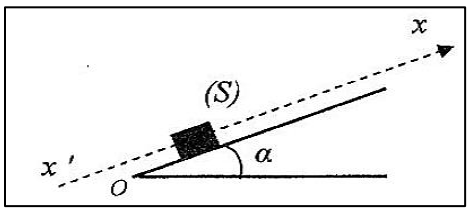
$BC$ (




$BD$ (

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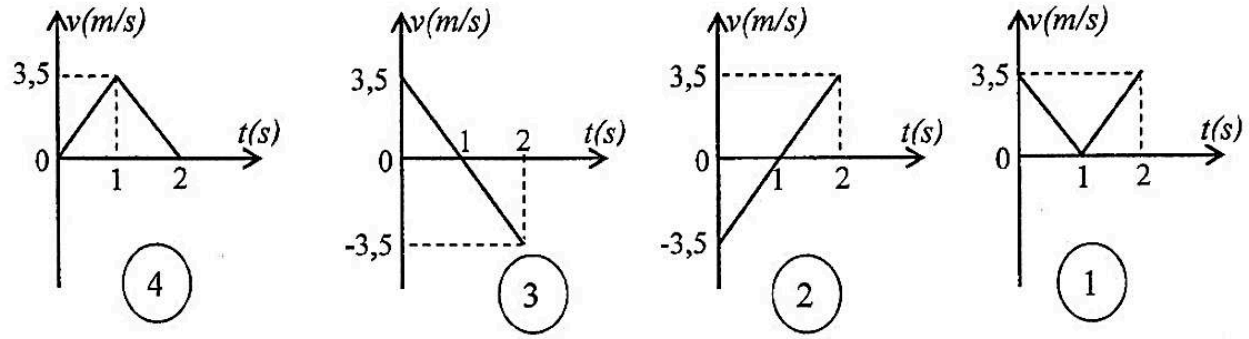
$t = 0$ $m = 1kg$ $(S)$ $\alpha$ -




$\vec{v}_0$ $O$

$(S)$

$v = f(t)$




$O$ $(S)$ -

$(S)$ -

$\alpha$

$t = 2s$ $t = 0$

$f$ -

$(S)$ -

$(S)$ -

$g = 9.8m \times s^{-2}$ $f = 1N$

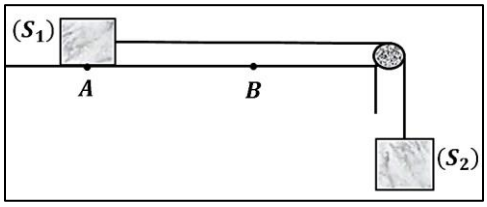
**7**

$g = 10m/s^2$

$(S_1)$ $(S_2)$ $m_2 = 500g$ $(S_2)$ $m_1 = 500g$ $(S_1)$

$A$ $(S_1)$ $t = 0$ $f$ $(S_1)$

$A$ $AB = 2m$




$(S_2)$ $(S_1)$ -

$(S_2)$ $(S_1)$ -

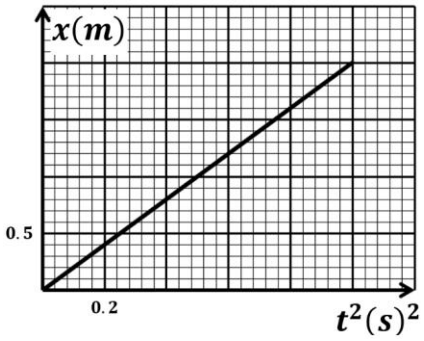
$\frac{d^2x}{dt^2} = \frac{g}{2} - \frac{f}{2m_1}$ $x$ -

$(S_1)$ -

-

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$(S_1)$ $x$ -




$t = 0$

$a$ -

$B$ -

$T$ $f$ -

$B$ $(S_1)$ -

-

-

$(S_1)$ -

$(S_1)$ $(S_2)$ -

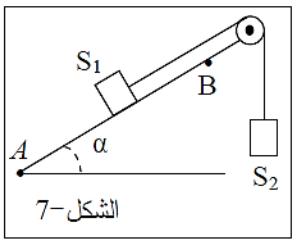
$(S_1)$ $(S_2)$ -

$g = 10m/s^2$

**2014** **8**

$m_1 = 400g$ $(S_1)$

$m_2 = 400g$ $(S_2)$ $\alpha = 30°$




$A$ $(S_1)$ $t = 0$

$g = 10m \times s^{-2}$

$(S_2)$ $(S_1)$ -

$(S_1)$ -

$AB = 1.25m$ $B$ $(S_1)$

$(S_1)$ -

$v = f(t)$

$(S_1)$ -

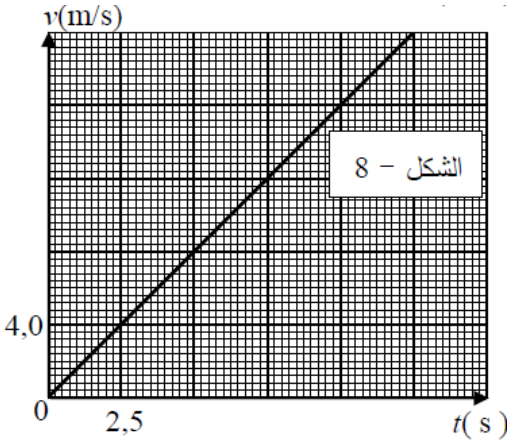
-

$(S_1)$

$\vec{f}$ $\frac{dv(t)}{dt} = \frac{g}{2}(1 - \sin\alpha) - \frac{f}{2m_1}$

$(S_1)$

$\vec{T}$ $\vec{f}$




**2011** **9**

$m_1 =$ $(S_1)$ $m_2 = 600g$ $(S_2)$

$\vec{f}$ $\alpha = 30°$ $800g$

$A$ $AB = x$ $A$ $t = 0$

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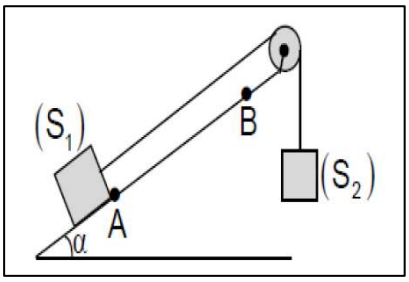
$(S_1)$ $(S_2)$ -

$(S_1)$ $(S_2)$ -

$\frac{d^2x}{d^2} = \frac{(m_2 - m_1 \sin\alpha)}{m_1+m_2} g - \frac{f}{m_1+m_2}$ $x$ -

$(S_1)$ -

-



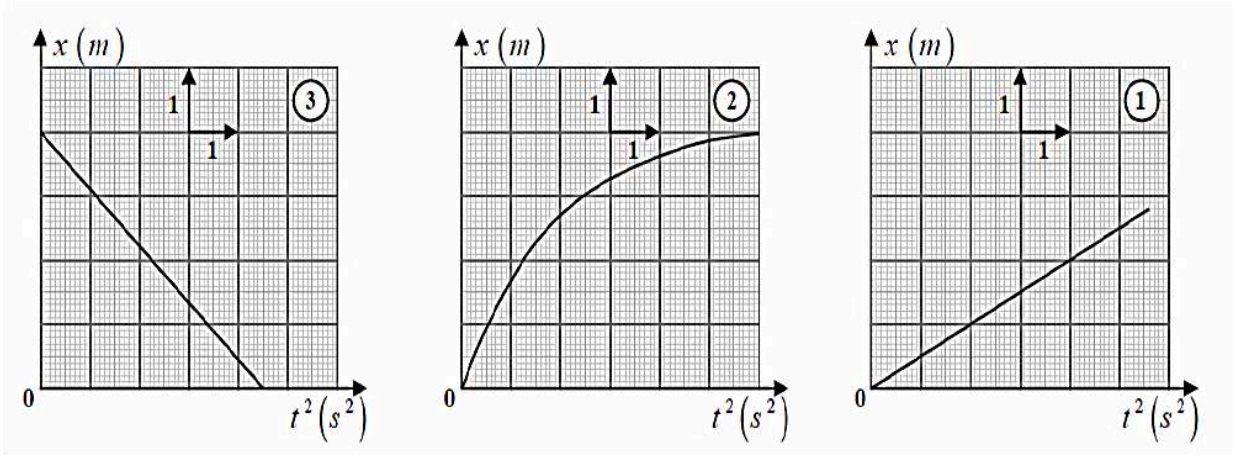

$x$ -

$(S_1)$

-

$a$ -

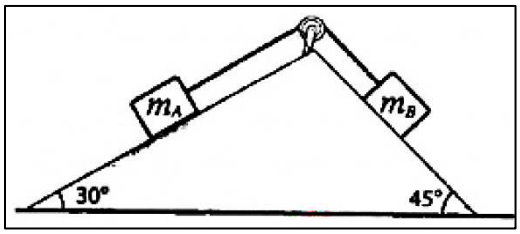
$g = 9.8m \times s^{-1}$ $T$ $f$ -




**10**

$m_B$ $B$ $m_A = 0.5kg$ $A$

$\beta = 45°$ $\alpha = 30°$



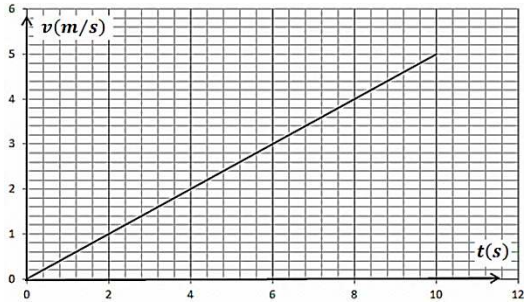

$\beta$ $\alpha$ $m_B$ $m_A$ -

$m_B$

$m_B = 2m_A$ $B$ -

$a = 3\,m/s^2$ -

$5s$ -




-

-

-

-

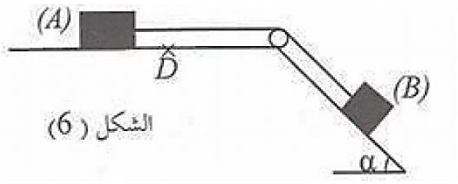
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$$a = \frac{g}{3}(2\sin\beta - \sin\alpha) - \frac{2f}{3m_A}$$

$g = 10\,m/s^2$ $T$ $f$ -

**2015** **11**

$m_B = 150g$ $(B)$ $m_A = 300g$ $(A)$




$(A)$

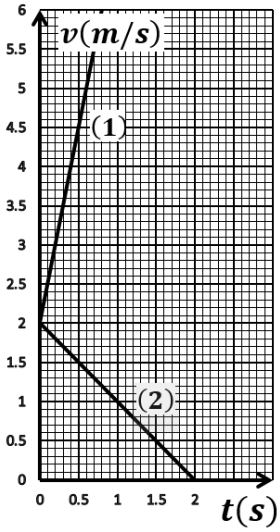
$g = 10m/s^2$ $\vec{f}$

-

$f$ $g$ $m_B$ $m_A$ $\alpha$ $\beta$ $\frac{dv}{dt} + \beta = 0$

$D$ $(A)$ -

$(B)$ $(A)$




-

-

-

$(A)$ -

$\alpha$ $\vec{f}$

**2013** **12**

$d$ $\alpha = 10°$ $BC$ $AB$

$m = 170kg$ $G$ $(S)$

$B$ $t_1 = 5s$ $v_A = 10\,m \times s^{-1}$ $t = 0$ $A$ $(S)$ -

$v_B$

$(S)$

$AB$

$BC$ $f = 500N$ $\vec{F}$ $BC$ -

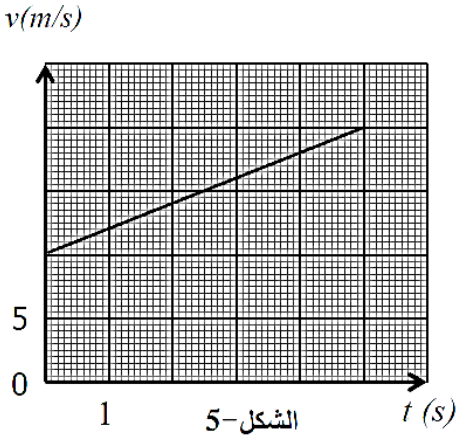
$AB$ $(S)$ $\vec{F}$ -

$P$ $v_C = 25\,m \times s^{-1}$ $C$ $(S)$ -

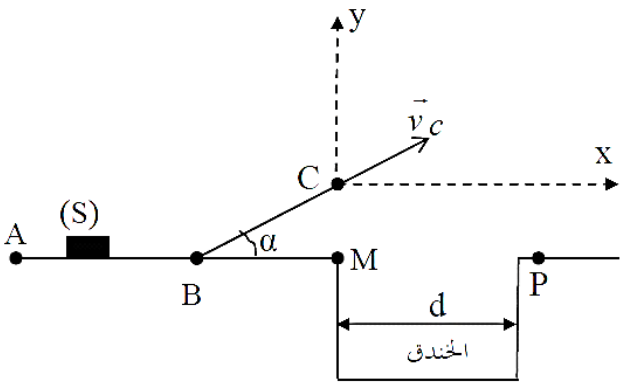
$(Cx, Cy)$ $(S)$ -

$BC = 56.3m$ $d = 40m$ -

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الشكل-5



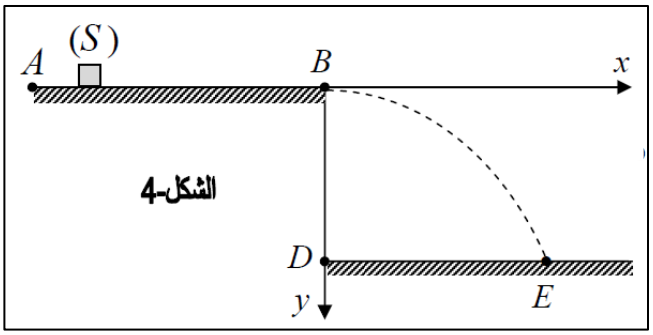
الشكل-4

**2014** **13**

$A$ $\vec{v}_0$ $m = 400g$ $(S)$ $t = 0$

$\vec{f}$ $(S)$ $AB = 1.4m$ $B$

$(S)$ -



الشكل-4

$\frac{dv}{dt} = -\frac{f}{m}$

$v(t)$ $A$

$m$ $v_0$ $f$ $x(t)$

$v^2 = f(x)$ -

$x$ $v^2$ -

$\vec{f}$ $v_0$

$\vec{v}_B$ $B$ $AB$ $(S)$ -

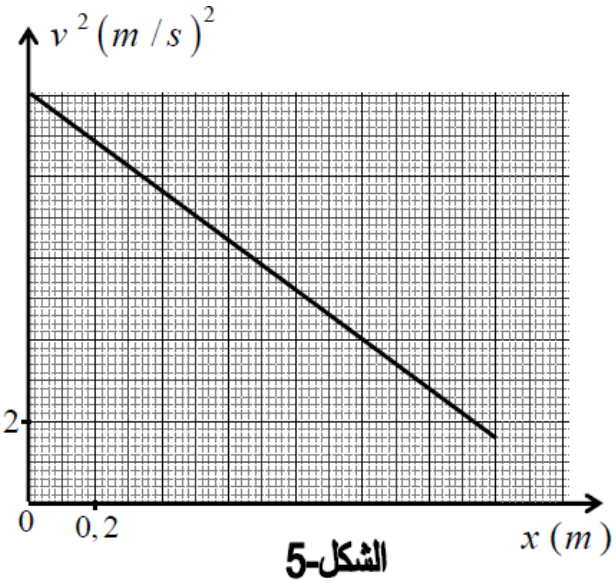
$\overline{BD} = 0.5m$ $E$

$(S)$ -

$(Bx, By)$ $B$

$y = f(x)$ -

$E$ $(S)$ $DE$

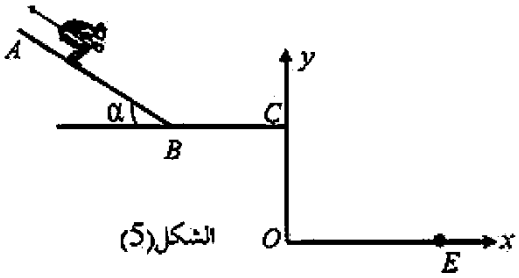


الشكل-5

$g = 10m \times s^{-2}$

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**2015** **14**



الشكل(5)

$AB = 50m$ $\alpha = 30°$ $AB$

$BC$

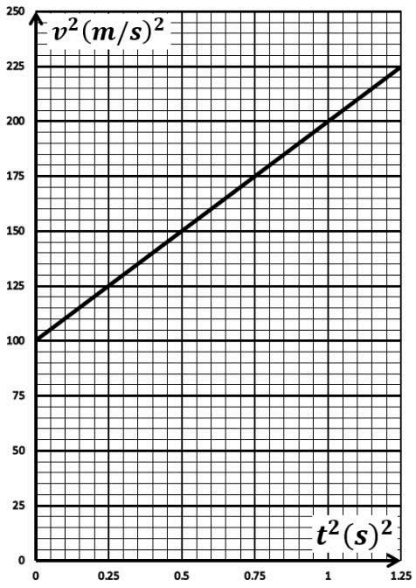
$h$ $CO$

$g = 10m/s^2$ $m = 80kg$

$B$ $A$ -

$v_B = 20\,m/s$ $B$ $ABC$ $\vec{f}$

$AB$




$C$ $BC$ -

$E$

$y(t)$ $x(t)$ -

$(ox, oy)$

-

$E$

$t^2$ $v^2$ $v_y$ $v_x$ $v$ -

$E$ $C$ -

$h$

**2016** **15**

$AO = d = 1{,}5m$ $(S)$ $f$

$N$ $O$ $A$ $\alpha = 45°$

$m = 500\text{g}$ $(S)$ $g = 9.8m/s^2$

$(S)$

$(S)$ $N$ $AO$

$(x_N = 0.62m\ , y_N = h = 1.00m\ )$

$AO$ $(S)$ $a$ $f$ -1

$f = m(\text{g}\sin\alpha - a)$ $AO$ $(S)$ -

$f$ $(S)$ $a$ -

$O$ $(S)$ $N$ $f$ -2

$(Ox, Oy)$ $(S)$ $y(t)$ $x(t)$ -

$y = f(x)$ -

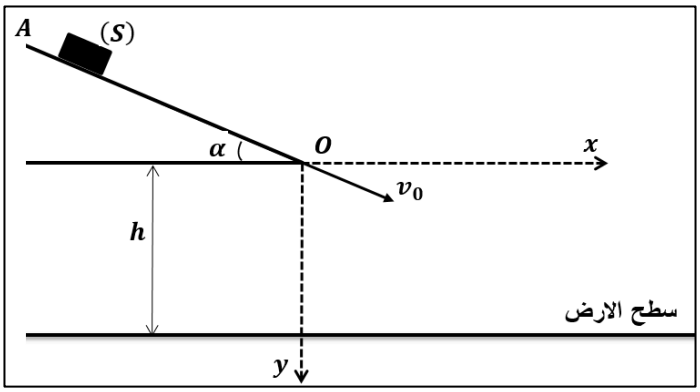
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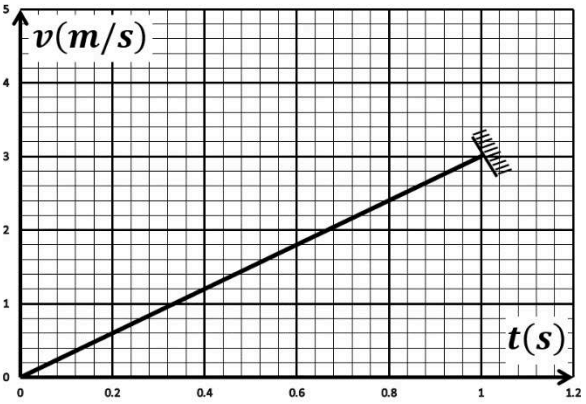
$(S)$ $v_0$ -

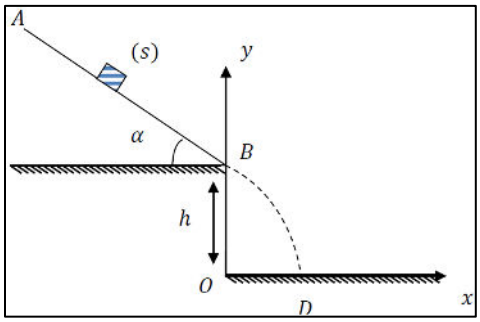
$AO$ $(S)$ $a$ -

$f$ 1 -

$1.8N \leq f \leq 2.0N$ -3




$g = 9.81\,m/s^2$

$m$ $(S)$

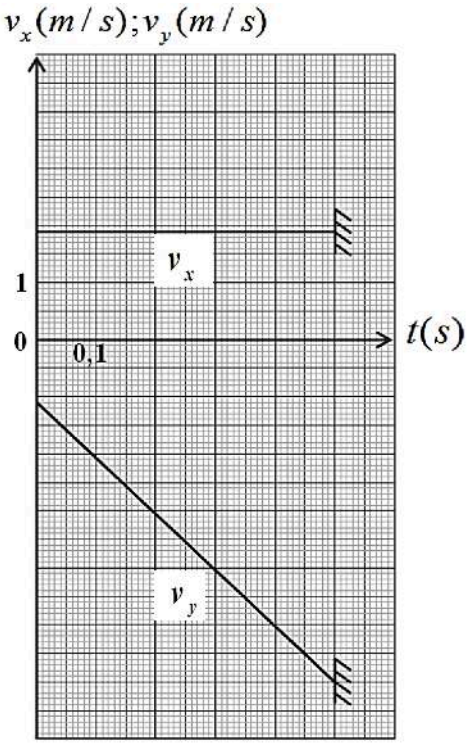
$AB = 1m$ α $A$

$B$

.I

$\vec{f}$

| $f(N)$ | 0,5 | 1,0 | 1,5 | 2,0 |
|---|---|---|---|---|
| $a(m/s^2)$ | 3,9 | 2,9 | 1,9 | 0,9 |




$(S)$ $a$ (1

$(S)$ $a$ (2

$\vec{f}$

$m$ α (3

$B$ $A$ $(S)$ (4

$(S)$ (5

$v_B = 2.19m/s$ $\vec{f}$ (

$\vec{f}$ (

$D$ $B$ $(S)$ .II

$(\overrightarrow{ox}, \overrightarrow{oy})$ $v_y$ $v_x$

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$(\overrightarrow{ox}, \overrightarrow{oy})$ $(S)$ (1

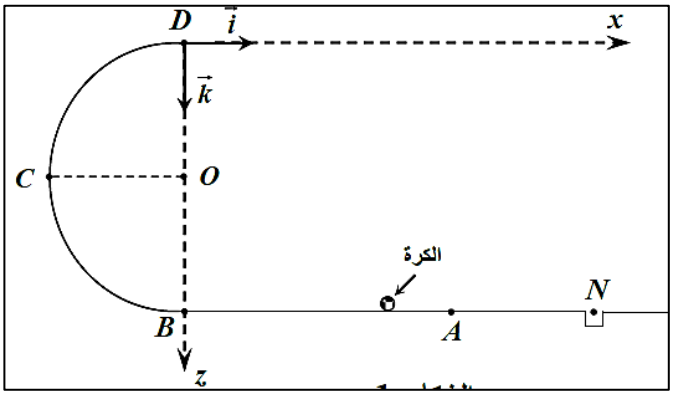
$x_D$ $h$ (2

$D$ $(S)$ (3

$A$ $m = 45g$

$BCD$ $B$ $A$ $N$ $D$ $C$ $B$ $N$

$B$ $D$ $r = 0.5m$ $O$




$C$ -

$A$ -

$D$ -

$v_D = 6.71m/s$

$v_A$ (

$D$ $\vec{R}$ (

$R = m\left(\frac{{v_A}^2}{r} - 5g\right)$

$x = 2v_D \times \sqrt{\frac{r}{g}}$ $A$ (

(

$AB = 2\,m \quad AN = 1\,m \quad g = 10\,m/s^2$

**2008** **18**

$\alpha = 30°$ $AB$ $A$ $(S)$

$AB = L$

$O$ $C$ $B$ $A$ $r$ $O$ $BC$ $B$ $AB$

$C$ $B$

$r = 2\,m \quad L = 5\,m \quad g = 10\,m/s^2$ $m = 0.2kg$ $(S)$

$\alpha$ $g$ $L$ $B$ $(S)$ -

$C$ $(S)$ -

$(S)$ $\alpha$ $g$ $m$ -

$v_I = 7.37\,m/s$ $I$ $(S)$ $BC$ $I$

$I$ $(S)$

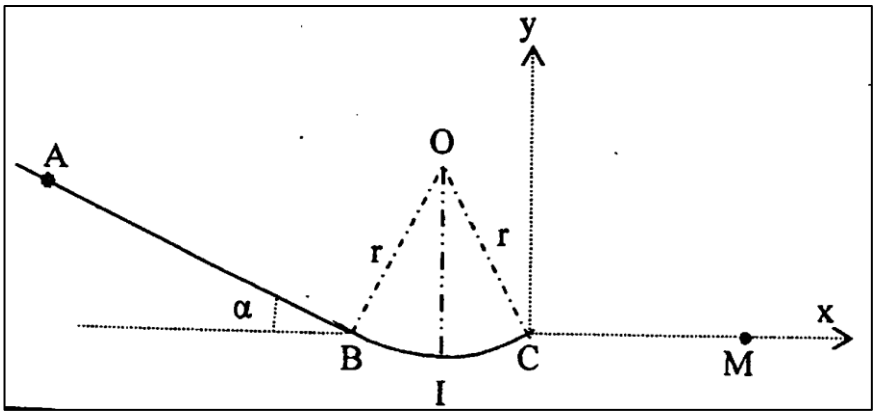
$BC$ $C$ $(S)$ -

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$(S)$ $t = 0$ $(S)$ $y = f(x)$ $(\overrightarrow{Cx}, \overrightarrow{Cy})$ -

$C$

$CM$ $M$ $C$ $B$ $(S)$ -

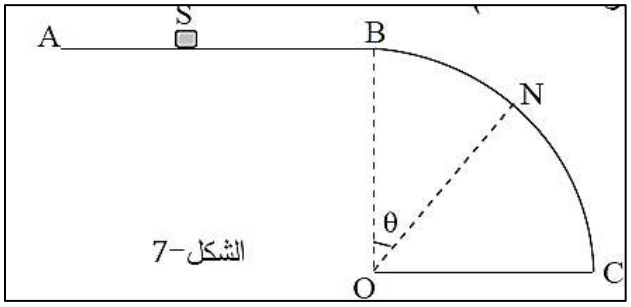



$r = 10m$ $BC$ $m = 100g$ $(S)$

$AB = d = 1m$ $\vec{v}_A$ $A$

$\vec{v}_B$ $BC$ $B$ $(S)$ $f = 0.8N$

$N$

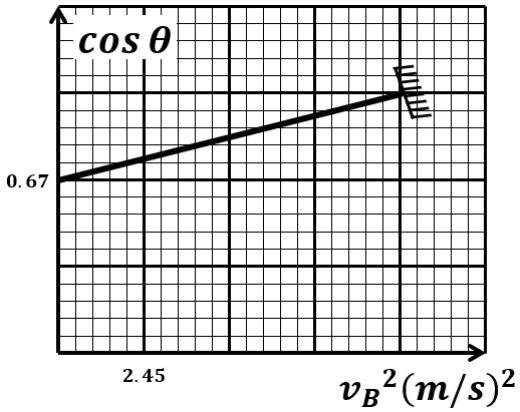



$AB$ $(S)$ -

$v_A$

$$v_A{}^2 = v_B{}^2 + \frac{2 \times d \times f}{m}$$

$\theta$ $v_B{}^2$ $\cos\theta$ -




$\vec{v}_N$ $N$ $(S)$

$\theta$ $r$ $g$ $v_B{}^2$ $v_N{}^2$ -

$(S)$ $\vec{R}$ -

$r$ $g$ $v_B{}^2$ $\cos\theta$

$N$ $(S)$

$g$

$v_A$ $\theta$ -

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