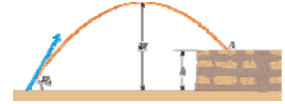


Using Screencasts to Present Homework Solutions in Introductory Physics

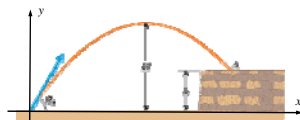
Dr. Randall Jones
Loyola University Maryland

<https://www.youtube.com/watch?v=hMoYmAJCSA8>

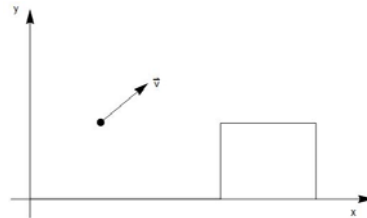
04-28 (Modified): In the figure, a stone is projected at a cliff of height h with an initial speed of 42.0 m/s directed at angle $\theta_0 = 60.0^\circ$ above the horizontal. The stone strikes at A, 5.50 s after launching. Find the height h of the cliff.



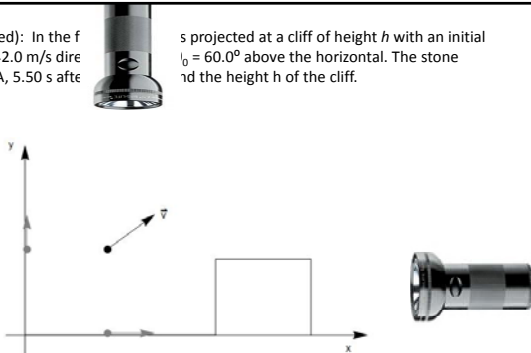
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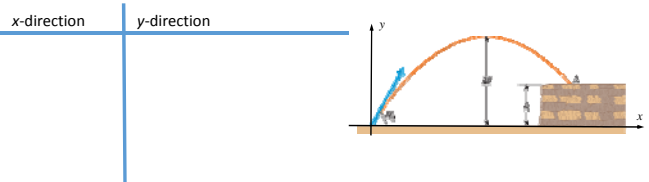
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x-direction	y-direction
$x(t) = v_0^x t$	$y(t) = v_0^y t - \frac{1}{2} a_y t^2$
$v_x(t) = v_0^x$	$v_y(t) = v_0^y - a_y t$

$a_x = +9.8\text{ m/s}^2$

PH201 - General Physics I - Equation Sheet			
Kinematics		Dynamics	
Position: $x(t) = x_0 + v_0 t + \frac{1}{2} a t^2$	Velocity: $v(t) = v_0 + a t$	Force: $\vec{F} = m\vec{a}$	Newton's Law: $\vec{F} = \frac{d\vec{p}}{dt}$
Acceleration: $a(t) = \frac{dv(t)}{dt} = \frac{d^2x(t)}{dt^2}$	Displacement: $\Delta x = \int v dt$	Work: $W = \int \vec{F} \cdot d\vec{r}$	Power: $P = \vec{F} \cdot \vec{v}$
Velocity: $v(t) = \frac{dx(t)}{dt}$	Position: $x(t) = \int v dt$	Impulse: $\vec{J} = \int \vec{F} dt$	Angular Momentum: $\vec{L} = \vec{r} \times \vec{p}$
Acceleration: $a(t) = \frac{dv(t)}{dt}$	Velocity: $v(t) = \frac{dx(t)}{dt}$	Angular Velocity: $\vec{\omega} = \frac{d\vec{\theta}}{dt}$	Angular Acceleration: $\vec{\alpha} = \frac{d\vec{\omega}}{dt}$

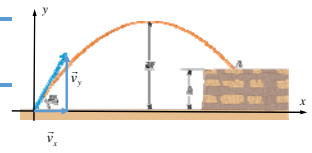
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$v_0^x = v_0 \cos \theta_0$
 $= (42\text{ m/s}) \cos 60^\circ$
 $= 21\text{ m/s}$

$v_0^y = v_0 \sin \theta_0 = (42\text{ m/s}) \sin 60^\circ$
 $= +36.4\text{ m/s}$



$$y(t) = v_0^y t - \frac{1}{2} a_y t^2 = (36.4\text{ m/s})(5.50\text{ s}) - \frac{1}{2}(9.8\text{ m/s}^2)(5.50\text{ s})^2 = 52.0\text{ m}$$

First Pass						Second Pass						Combined Result						Avg	
Q1	Q2	Q3	Q4	Q5	Q6	Q1	Q2	Q3	Q4	Q5	Q6	Q1	Q2	Q3	Q4	Q5	Q6		
1	1	1	1	0.75	0.75	1	1	1	1	0.5	1	1	1	1	0.88	0.75	90	92	
0.75	0.75	1	1	0.5	0	0	0	0	0	0	0	1	0.75	0.75	1	1	0.5	83	83
1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1	100	100
1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1	100	100
1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1	100	100
1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1	100	100
1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1	99	99
0.87	0.75	1	1	1	0.5	1	1	1	1	1	0.94	0.88	1	1	1	0.75	86	92	
1	0.75	1	1	1	1	1	1	1	1	1	0.88	1	1	1	1	1	1	96	98
1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1	100	100
1	1	1	1	1	0.5	0	0	0	0	0	1	1	1	1	1	1	0.5	91	91
1	0.75	1	1	1	1	1	1	1	1	1	1	0.88	1	1	1	1	1	85	85
1	1	1	1	0.5	0.5	1	1	1	1	1	1	1	1	1	1	0.75	0.75	86	93
0	0	0	0	0	0	1	1	1	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	13	16
0.97	0.75	1	1	1	1	0	0	0	0	0	0.97	0.75	1	1	1	1	1	85	85
0.75	1	0.5	1	0	1	1	1	1	1	1	0.88	1	0.75	1	0.5	1	0.74	86	86
1	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1	1	1	99	99
1	0.5	1	0.75	0.5	0	1	1	1	0.75	1	0.75	1	0.75	0.75	0.88	0.75	0.88	66	79
1	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1	1	1	99	99
0.62	0.75	0.5	0.75	0.5	0.5	1	0.75	1	1	1	0.81	0.75	0.75	0.88	0.75	0.75	66	81	
1	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1	1	1	100	100
1	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1	1	1	99	99
1	1	0.5	1	1	1	1	1	1	1	1	1	0.75	1	1	1	1	1	90	94
0.5	1	1	1	1	0.75	0	0	0	0	0	0.5	1	1	1	0.75	0.88	86	86	
0	0	0	0	0	0	0.5	1	1	1	1	0.5	0.25	0.5	0.5	0.5	0.5	14	50	
1	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1	1	1	97	97