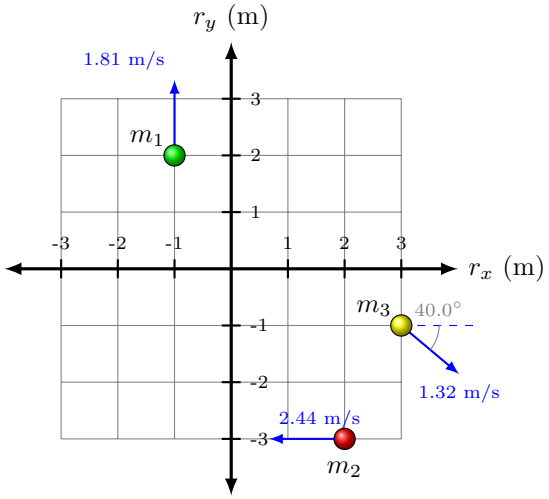
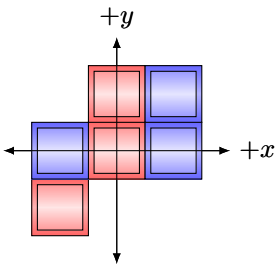
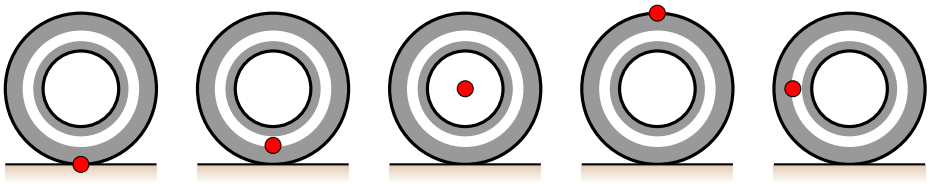
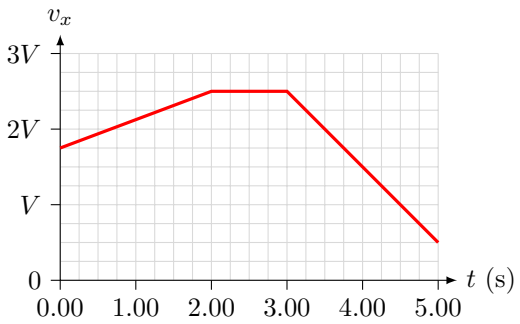






A. B. C. D. E.



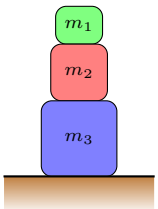
A. 1, 2, 2

B. 1, 2, 3

C. 2, 3, 3

D. 2, 3, 4

E. 3, 3, 3



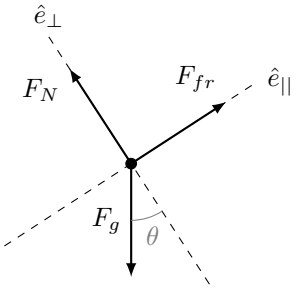
A. ←

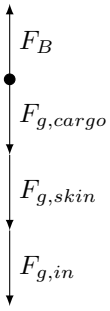
B. ↓

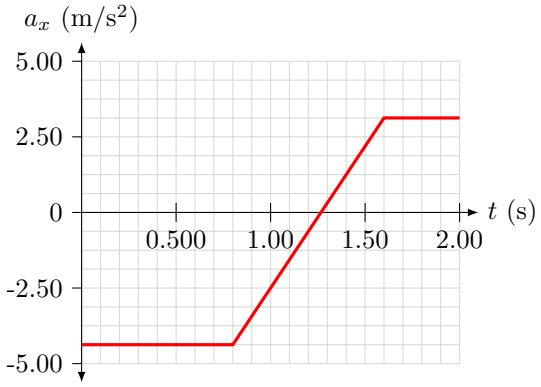
C. 

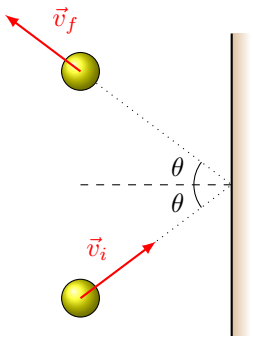
D. 

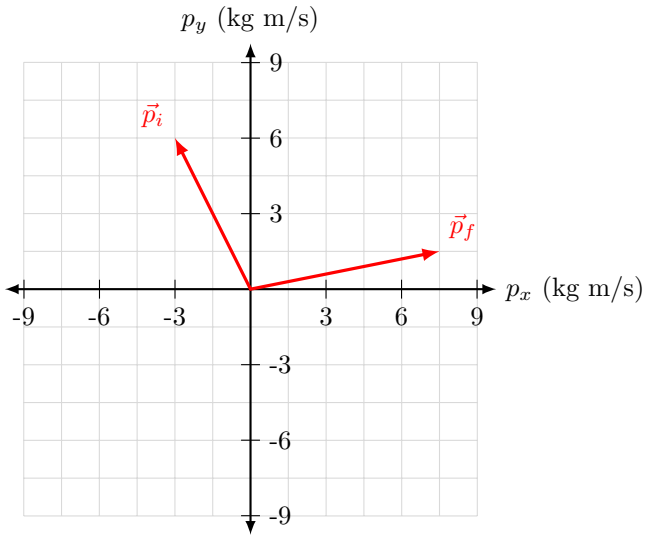
E. zero $\vec{F}$











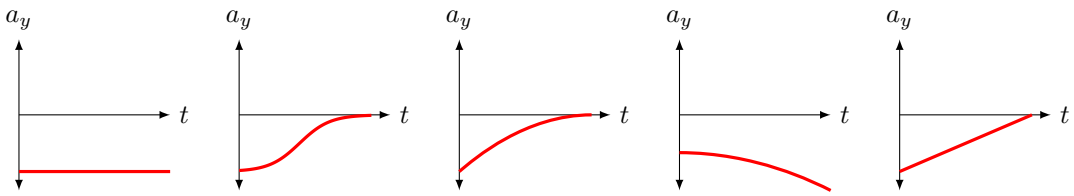
A. $(-3.50 \text{ kg m/s})\hat{x} + (1.50 \text{ kg m/s})\hat{y}$

B. $(-3.00 \text{ kg m/s})\hat{x} + (6.00 \text{ kg m/s})\hat{y}$

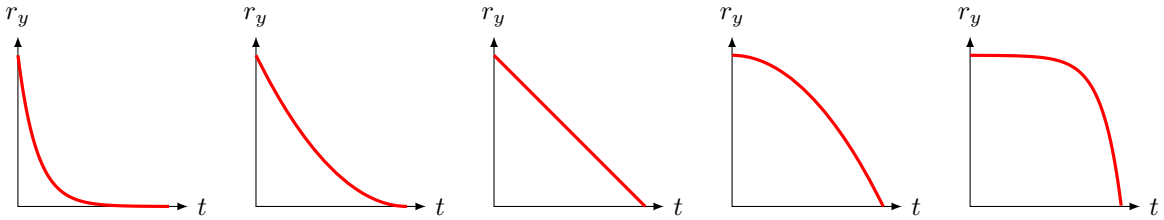
C. $(3.50 \text{ kg m/s})\hat{x} + (-1.50 \text{ kg m/s})\hat{y}$

D. $(7.50 \text{ kg m/s})\hat{x} + (1.50 \text{ kg m/s})\hat{y}$

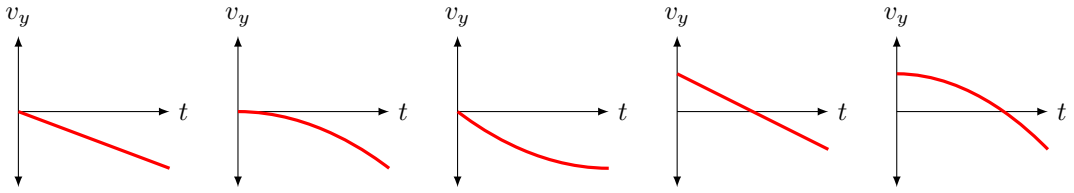
E. $(10.5 \text{ kg m/s})\hat{x} + (-4.50 \text{ kg m/s})\hat{y}$



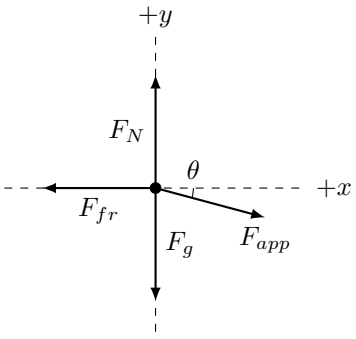
A. B. C. D. E.

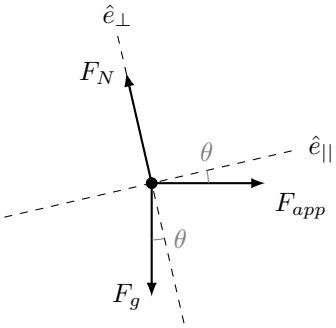


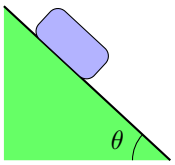
A. B. C. D. E.

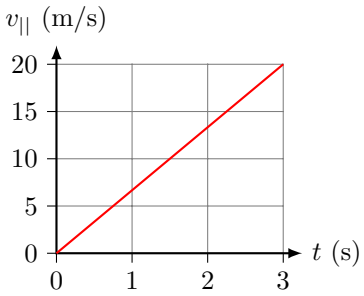


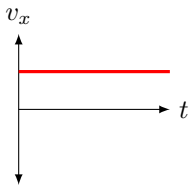
A. B. C. D. E.



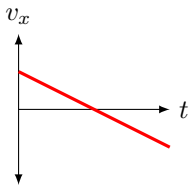

$\hat{e}_\perp$
F_N
θ
$\hat{e}_{||}$
F_{app}
θ
F_g


θ

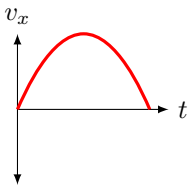

$v_{||}$ (m/s)
20
15
10
5
0
0
1
2
3
t (s)


v_x
t

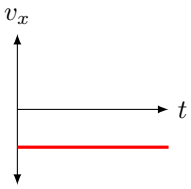
A.


v_x
t

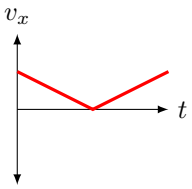
B.


v_x
t

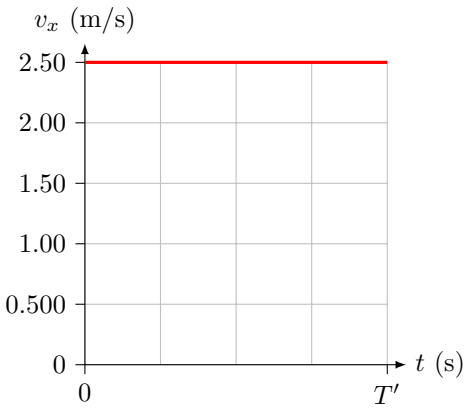
C.

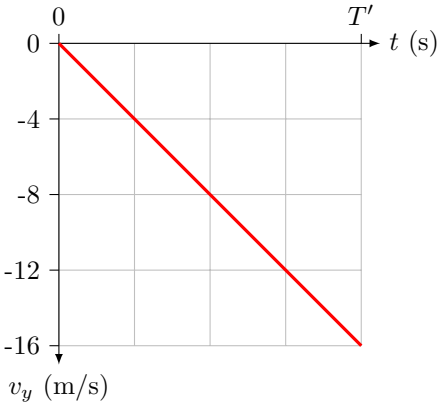

v_x
t

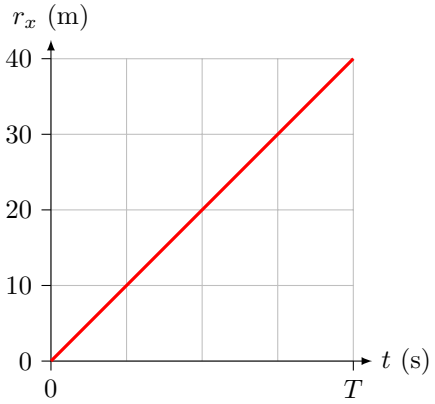
D.

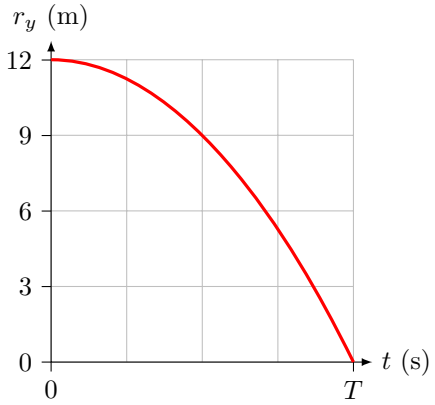

v_x
t

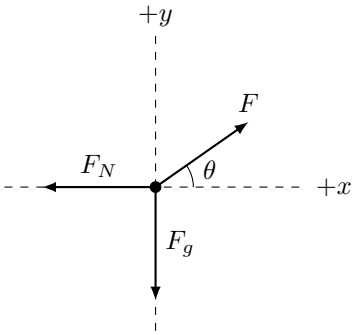
E.

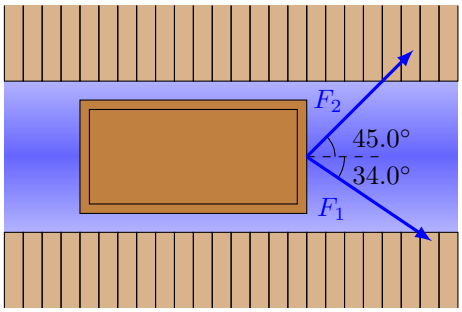

v_x (m/s)
2.50
2.00
1.50
1.00
0.500
0
0
T'
t (s)

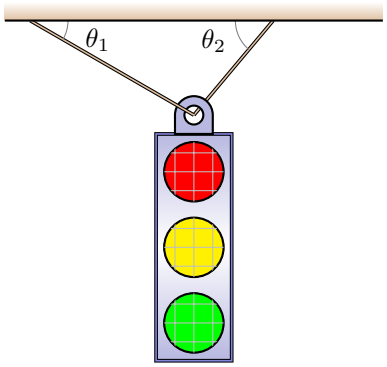

0
T'
0
-4
-8
-12
-16
t (s)
v_y (m/s)

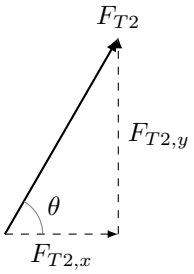

r_x (m)
40
30
20
10
0
0
T
t (s)

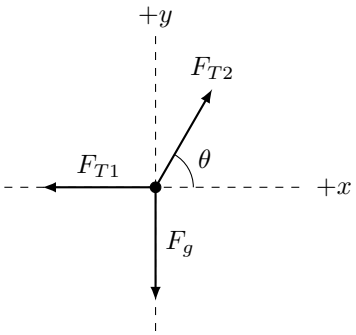

r_y (m)
12
9
6
3
0
0
T
t (s)

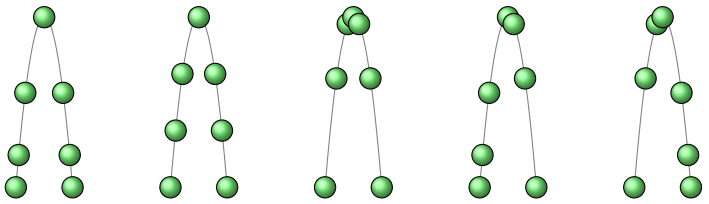

$+y$
F
F_N
θ
$+x$
F_g


F_2
45.0°
34.0°
F_1

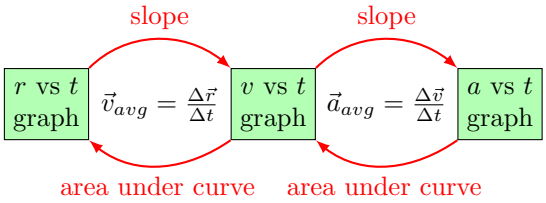

θ_1
θ_2

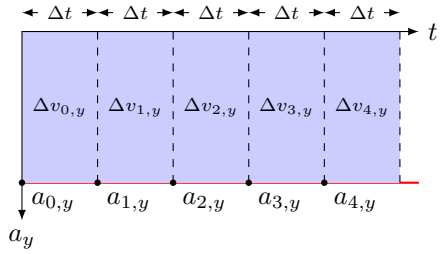

F_{T2}
$F_{T2,y}$
θ
$F_{T2,x}$

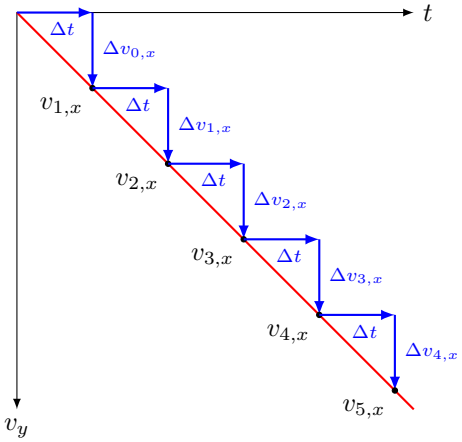

+y
F_{T2}
F_{T1}
θ
+x
F_g

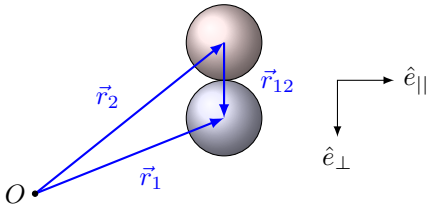


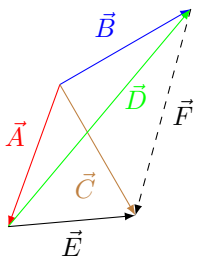
A. **B.** **C.** **D.** **E.**

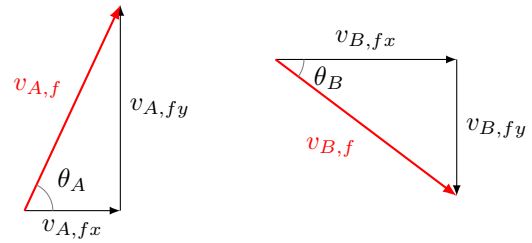

slope
slope
r vs t graph
$\vec{v}_{avg} = \frac{\Delta\vec{r}}{\Delta t}$
v vs t graph
$\vec{a}_{avg} = \frac{\Delta\vec{v}}{\Delta t}$
a vs t graph
area under curve
area under curve

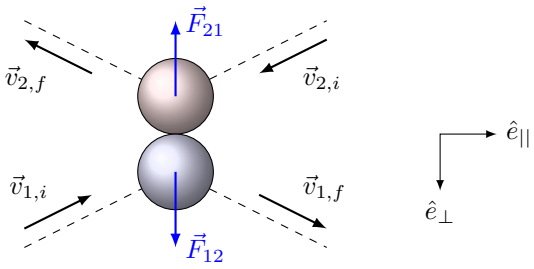

Δt Δt Δt Δt Δt
t
$\Delta v_{0,y}$ $\Delta v_{1,y}$ $\Delta v_{2,y}$ $\Delta v_{3,y}$ $\Delta v_{4,y}$
$a_{0,y}$ $a_{1,y}$ $a_{2,y}$ $a_{3,y}$ $a_{4,y}$
a_y


t
Δt
$\Delta v_{0,x}$
$v_{1,x}$
Δt
$\Delta v_{1,x}$
$v_{2,x}$
Δt
$\Delta v_{2,x}$
$v_{3,x}$
Δt
$\Delta v_{3,x}$
$v_{4,x}$
Δt
$\Delta v_{4,x}$
$v_{5,x}$
v_y

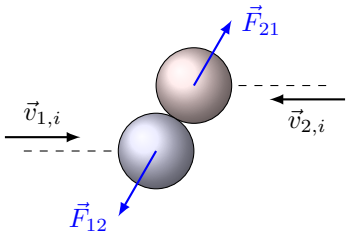

$\vec{r}_2$
$\vec{r}_{12}$
$\hat{e}_{||}$
$\hat{e}_\perp$
$\vec{r}_1$
O

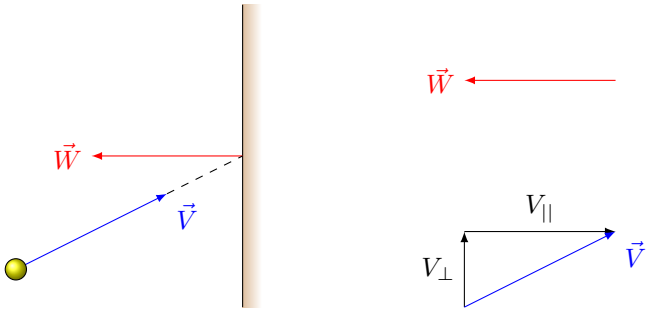

$\vec{B}$
$\vec{D}$
$\vec{F}$
$\vec{A}$
$\vec{C}$
$\vec{E}$

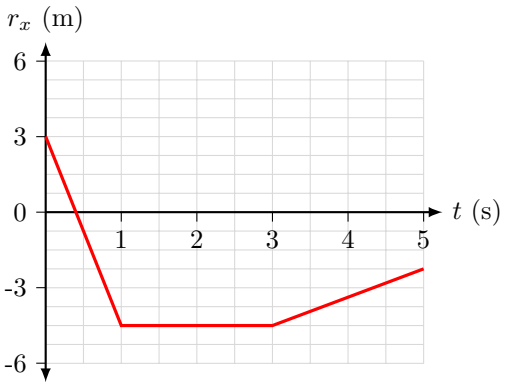

$v_{A,f}$
$v_{A,fy}$
θ_A
$v_{A,fx}$
$v_{B,fx}$
θ_B
$v_{B,f}$
$v_{B,fy}$

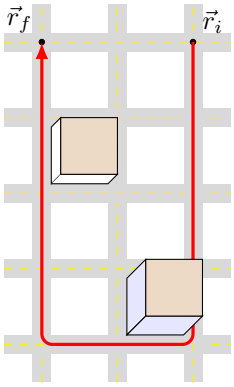

$\vec{F}_{21}$
$\vec{v}_{2,f}$
$\vec{v}_{2,i}$
$\vec{v}_{1,i}$
$\vec{v}_{1,f}$
$\vec{F}_{12}$

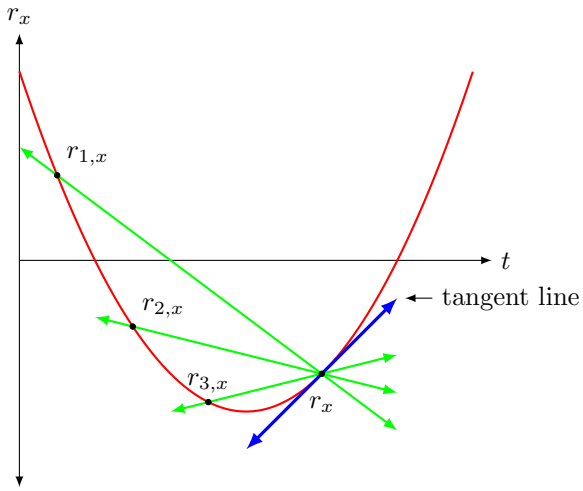
$\hat{e}_{||}$
$\hat{e}_{\perp}$

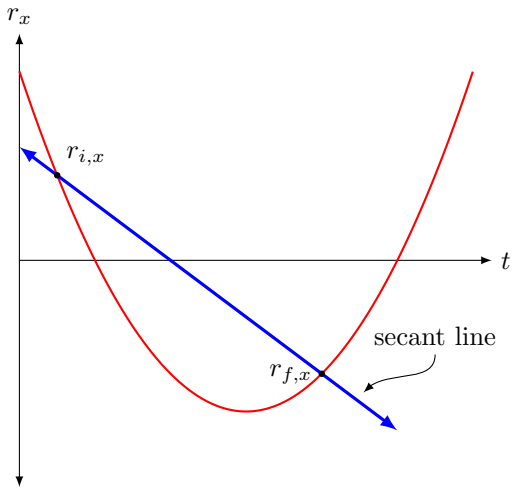

$\vec{F}_{21}$
$\vec{v}_{1,i}$
$\vec{v}_{2,i}$
$\vec{F}_{12}$

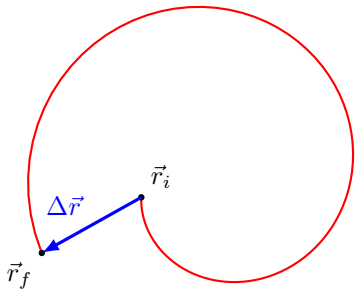

$\vec{W}$
$\vec{V}$
$\vec{W}$
$V_{||}$
$V_{\perp}$
$\vec{V}$

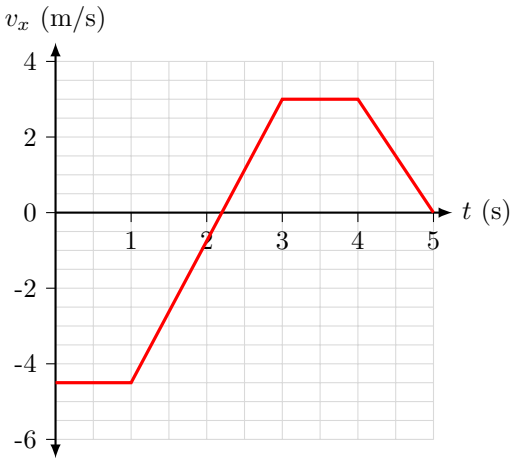

r_x (m)
6
3
0
-3
-6
1
2
3
4
5
t (s)

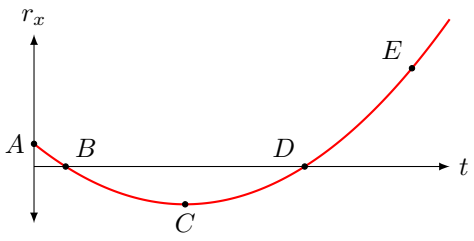

$\vec{r}_f$
$\vec{r}_i$

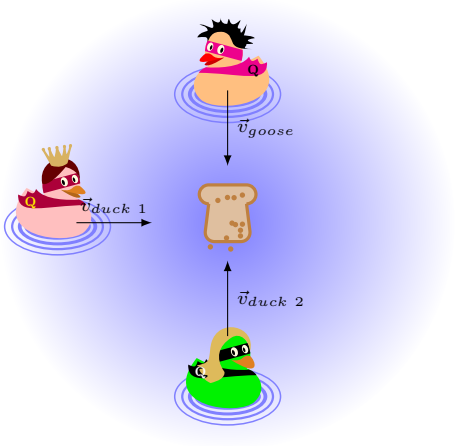

r_x
$r_{1,x}$
t
$r_{2,x}$
← tangent line
$r_{3,x}$
r_x

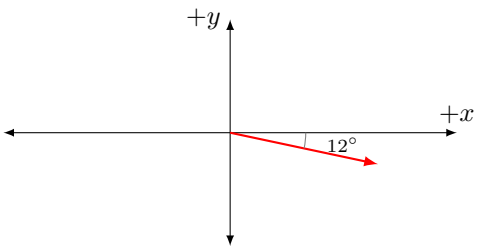

r_x
$r_{i,x}$
t
secant line
$r_{f,x}$

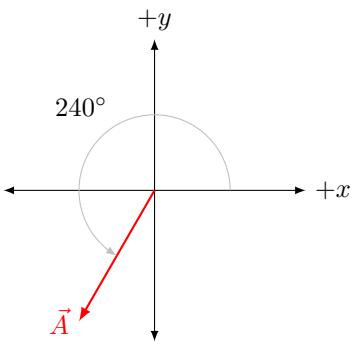

$\vec{r}_i$
$\Delta\vec{r}$
$\vec{r}_f$

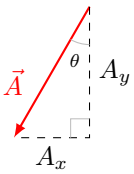

v_x (m/s)
4
2
0
-2
-4
-6
1
2
3
4
5
t (s)

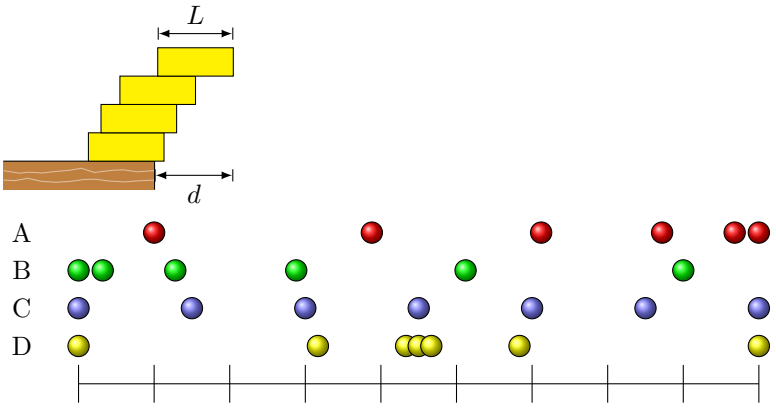

r_x
A
B
C
D
E
t

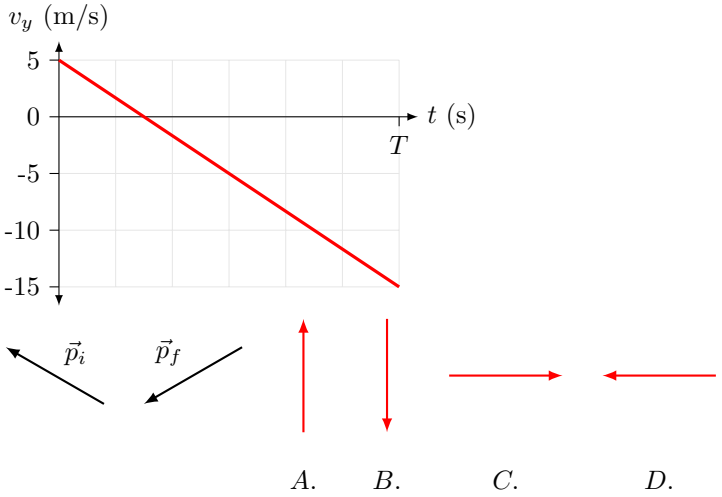

$\vec{v}_{goose}$
$\vec{v}_{duck\ 1}$
$\vec{v}_{duck\ 2}$


$+y$
$+x$
12°


$+y$
240°
$+x$
$\vec{A}$

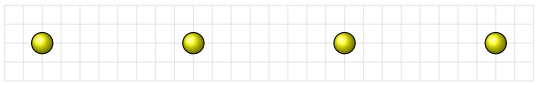

$\vec{A}$
θ
A_y
A_x



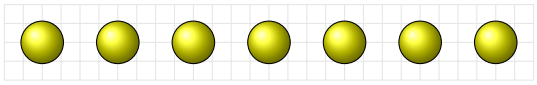


A. *B.* *C.* *D.*

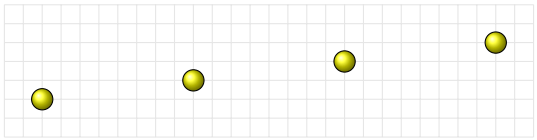
A.



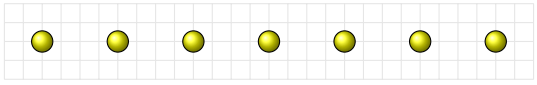
B.



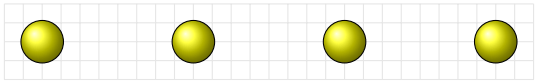
C.



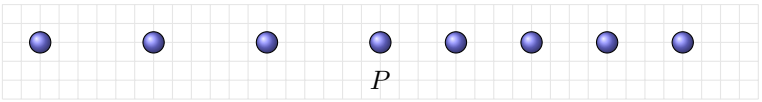
D.



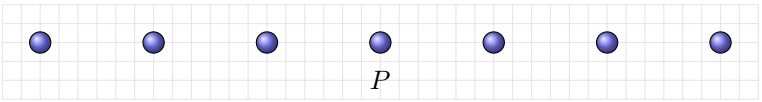
E.



A.



B.



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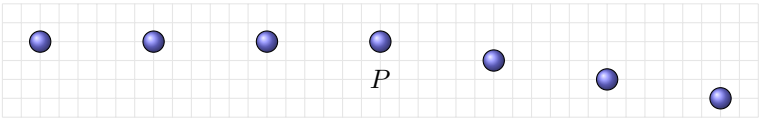
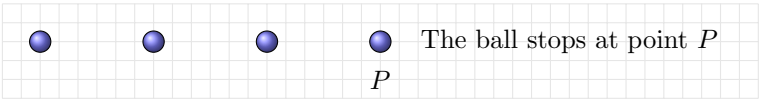
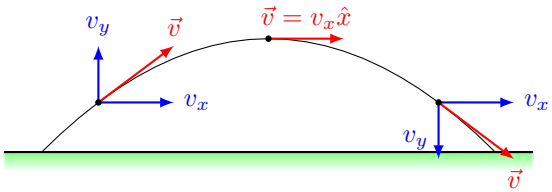
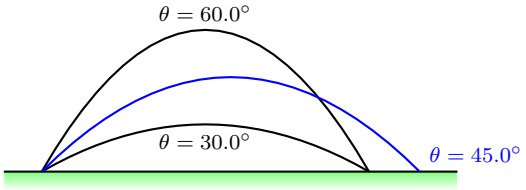


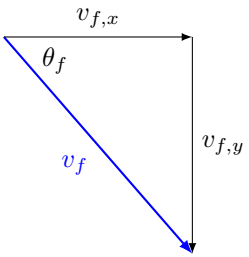
D.

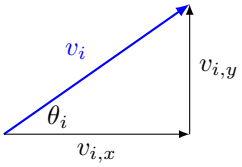


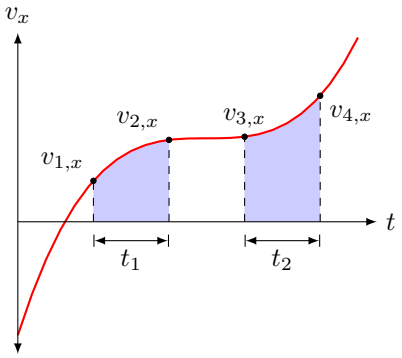
The ball stops at point P

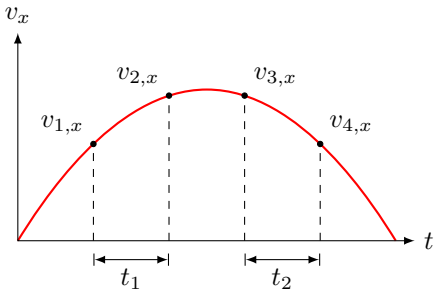


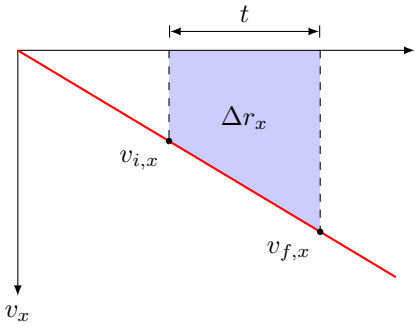


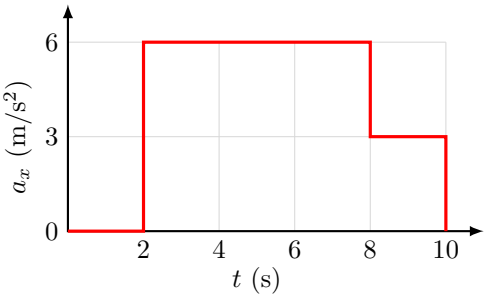


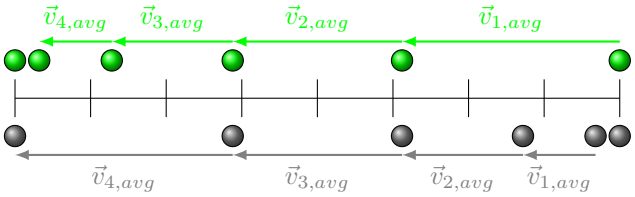


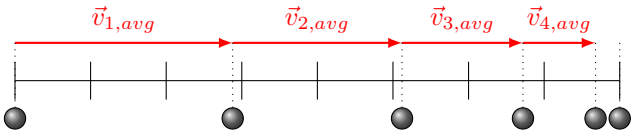


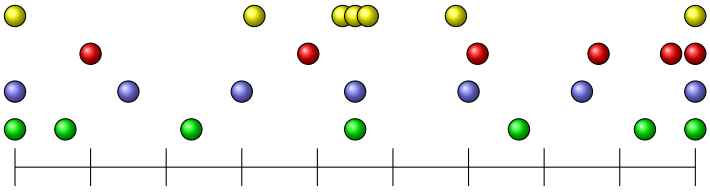

v_x
$v_{1,x}$
$v_{2,x}$
$v_{3,x}$
$v_{4,x}$
t
t_1
t_2

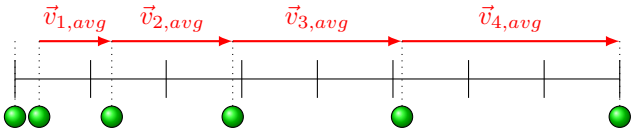

t
Δr_x
$v_{i,x}$
$v_{f,x}$
v_x

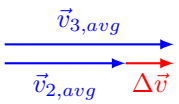

6
3
0
a_x (m/s^2)
2
4
6
8
10
t (s)

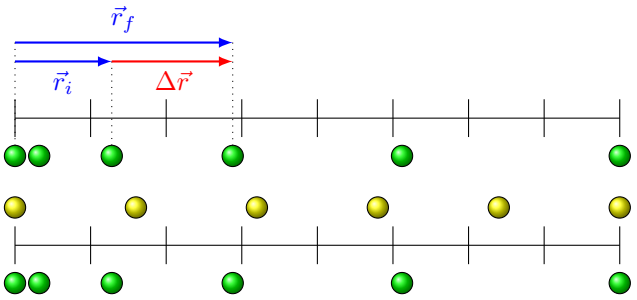

$\vec{v}_{4,avg}$
$\vec{v}_{3,avg}$
$\vec{v}_{2,avg}$
$\vec{v}_{1,avg}$
$\vec{v}_{4,avg}$
$\vec{v}_{3,avg}$
$\vec{v}_{2,avg}$
$\vec{v}_{1,avg}$

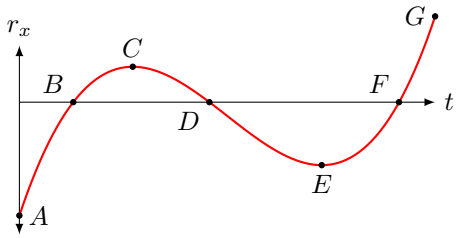

$\vec{v}_{1,avg}$
$\vec{v}_{2,avg}$
$\vec{v}_{3,avg}$
$\vec{v}_{4,avg}$

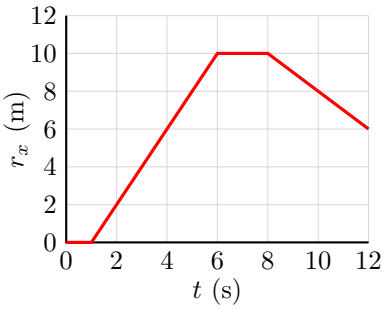


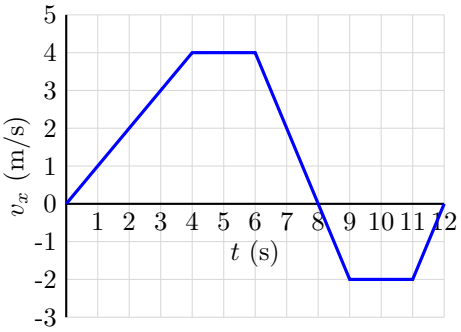

$\vec{v}_{1,avg}$
$\vec{v}_{2,avg}$
$\vec{v}_{3,avg}$
$\vec{v}_{4,avg}$


$\vec{v}_{3,avg}$
$\vec{v}_{2,avg}$
$\Delta\vec{v}$

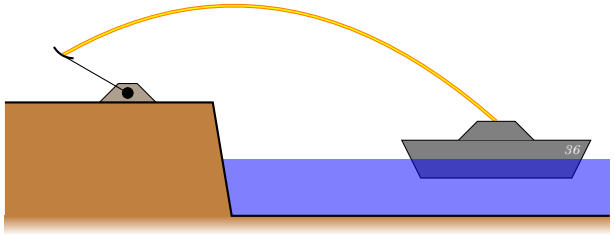


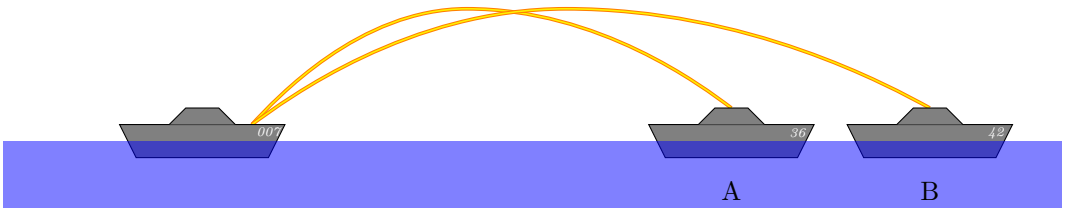


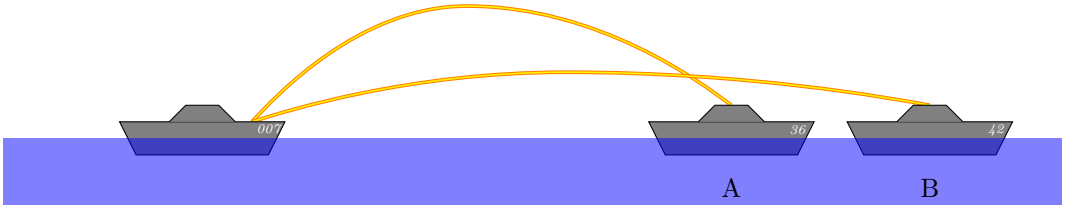


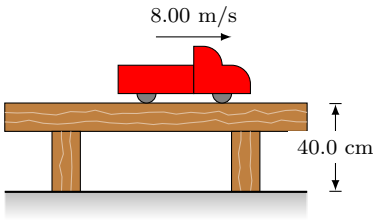


$$\frac{87{,}996.9\ \cancel{\text{t}}}{1} \left| \frac{1000\ \cancel{\text{kg}}}{1\ \cancel{\text{t}}} \right| \frac{10^3\ \text{g}}{1\ \cancel{\text{kg}}} = 87{,}996{,}900{,}000\ \text{g}$$

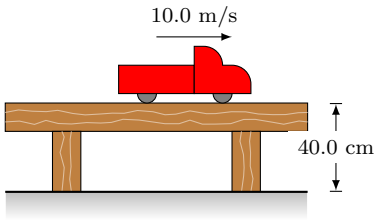




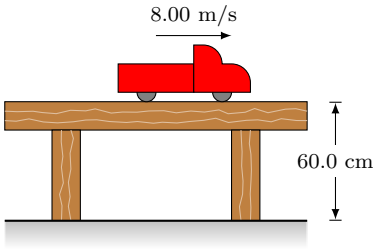

A
B


8.00 m/s
40.0 cm

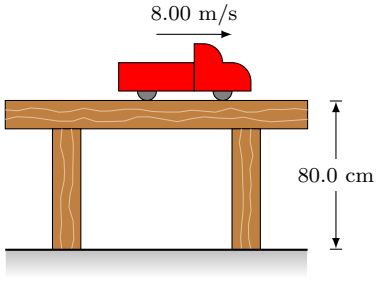
A.


10.0 m/s
40.0 cm

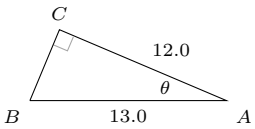
B.

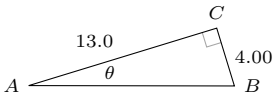

8.00 m/s
60.0 cm

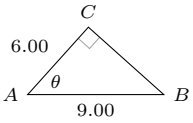
A.

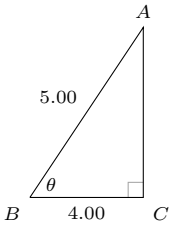

8.00 m/s
80.0 cm

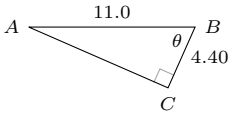
B.

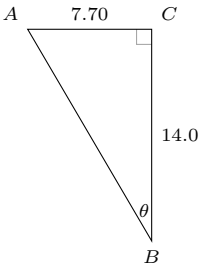

C
12.0
θ
B
13.0
A

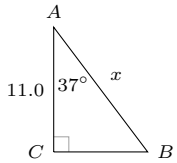

C
13.0
4.00
θ
A
B

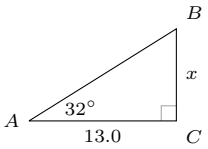

C
6.00
θ
A
B
9.00

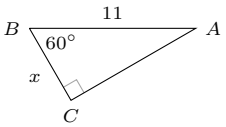

A
5.00
θ
B
4.00
C

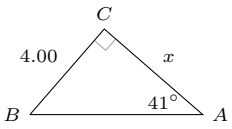

11.0
A
B
θ
4.40
C

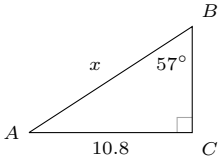

A
7.70
C
14.0
θ
B

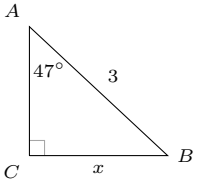

A
11.0
37°
x
C
B

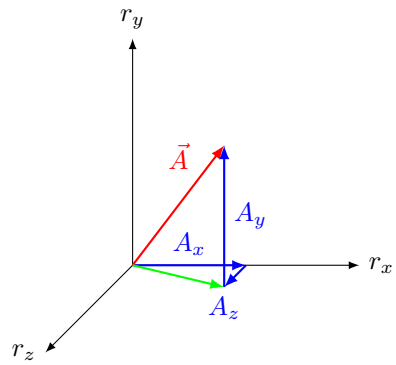

B
x
A
32°
13.0
C

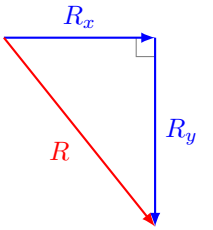

11
B
A
60°
x
C

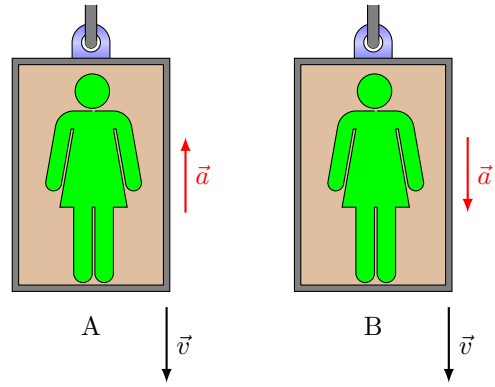

C
4.00
x
41°
B
A

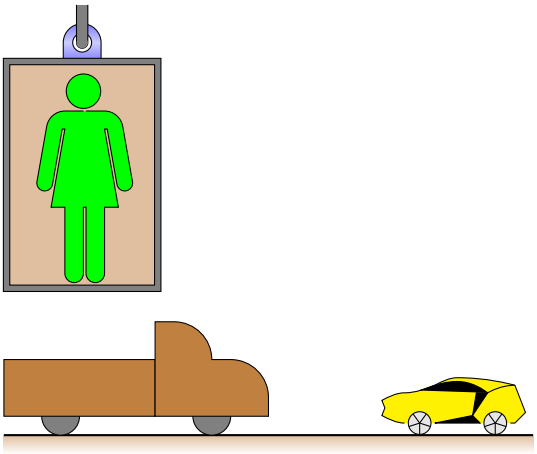

B
x
57°
A
10.8
C

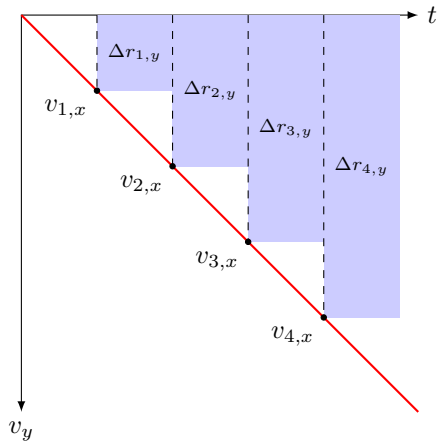

A
47°
3
C
x
B


r_y
$\vec{A}$
A_y
A_x
r_x
A_z
r_z

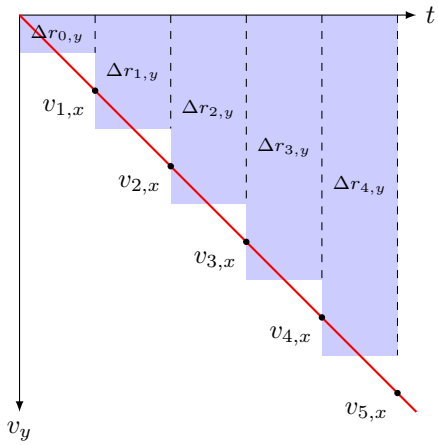

R_x
R_y
R


$\vec{a}$
$\vec{a}$
A
B
$\vec{v}$
$\vec{v}$

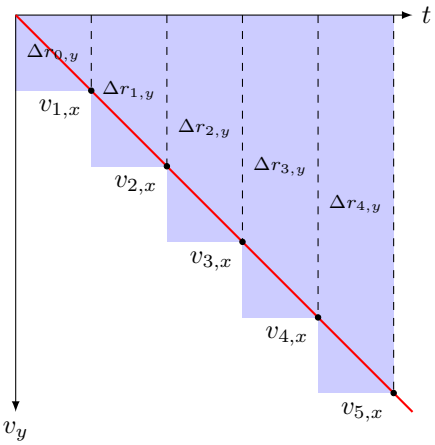




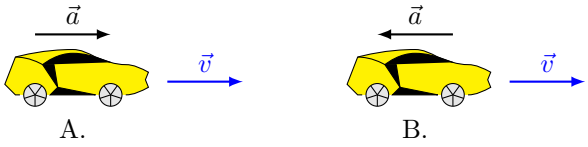
Update using initial velocity

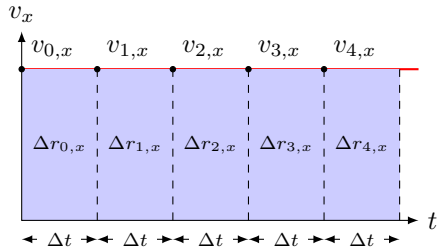


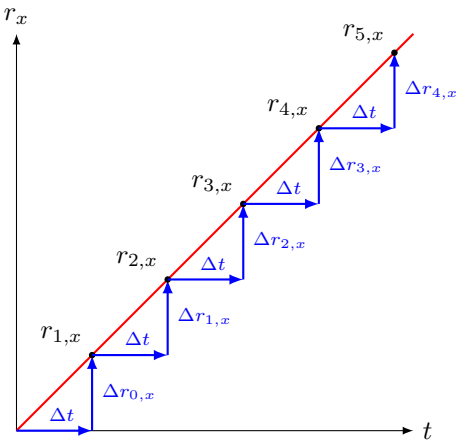
Update using average velocity

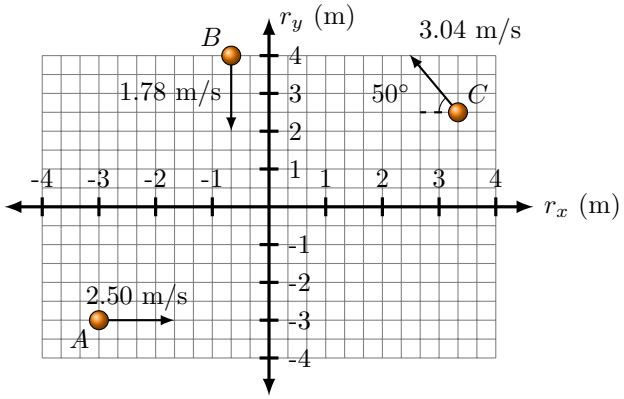


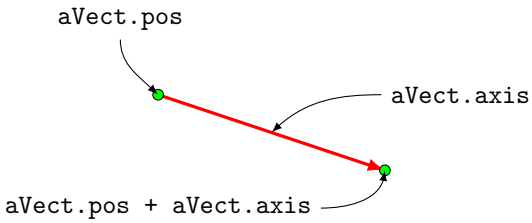
Update using final velocity

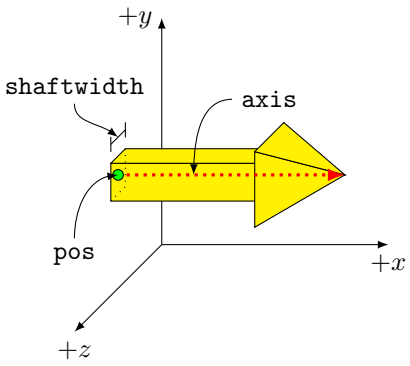


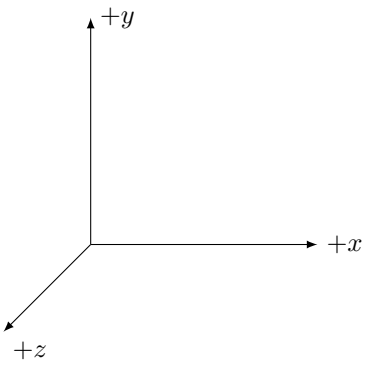


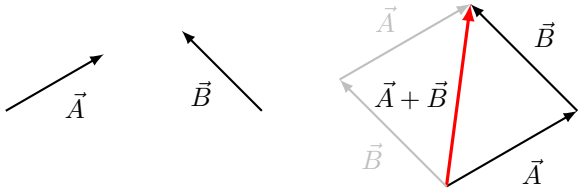


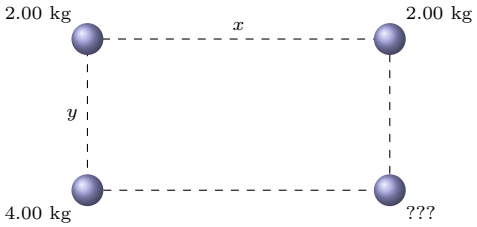


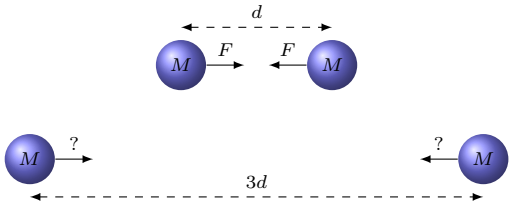

aVect.pos
aVect.axis
aVect.pos + aVect.axis

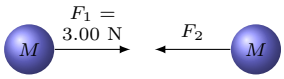

+y
shaftwidth
axis
pos
+x
+z

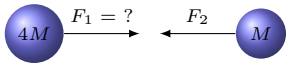

+y
+x
+z

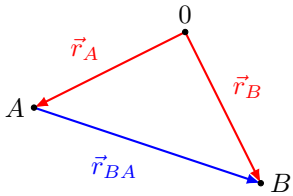

$\vec{A}$
$\vec{B}$
$\vec{A}$
$\vec{A}+\vec{B}$
$\vec{B}$
$\vec{B}$
$\vec{A}$

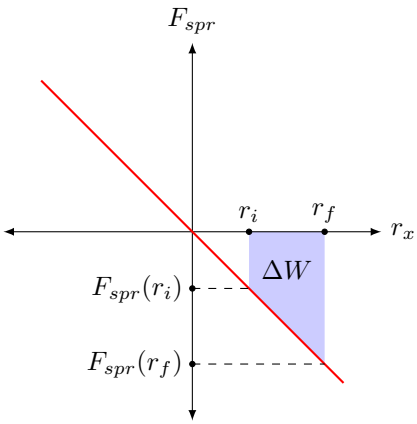

2.00 kg
x
2.00 kg
y
4.00 kg
???

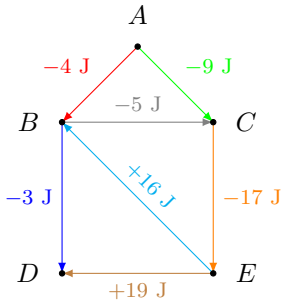

d
M
F
F
M
M
?
?
M
3d

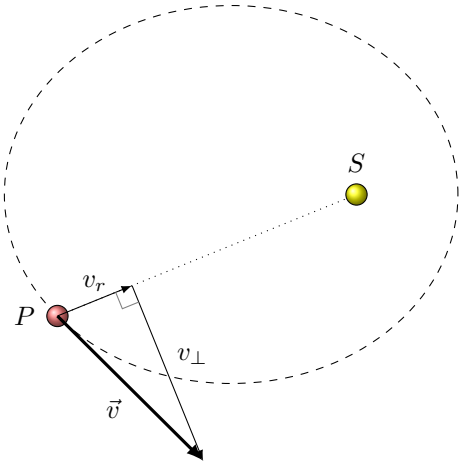

$F_1 =$
3.00 N
F_2
M
M

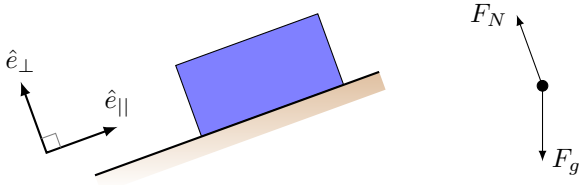

$4M$
$F_1 = ?$
F_2
M

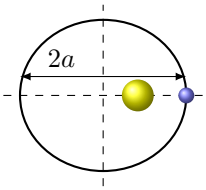

0
$\vec{r}_A$
$\vec{r}_B$
A
$\vec{r}_{BA}$
B

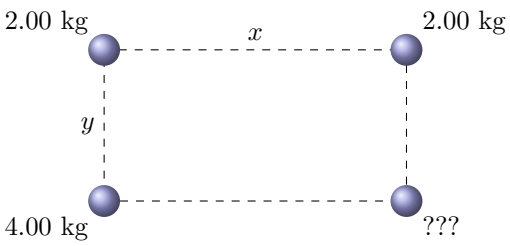

F_{spr}
r_i
r_f
r_x
ΔW
$F_{spr}(r_i)$
$F_{spr}(r_f)$

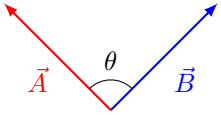

A
−4 J
−9 J
−5 J
B
C
−3 J
+16 J
−17 J
D
E
+19 J

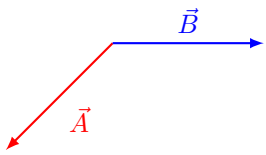

S
v_r
P
$v_\perp$
$\vec{v}$


$\hat{e}_\perp$
$\hat{e}_{||}$
F_N
F_g

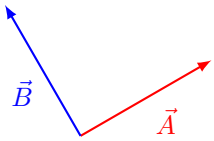

2a


2.00 kg
x
2.00 kg
y
4.00 kg
???


θ
A
B


B
A

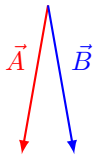
A.


B
A

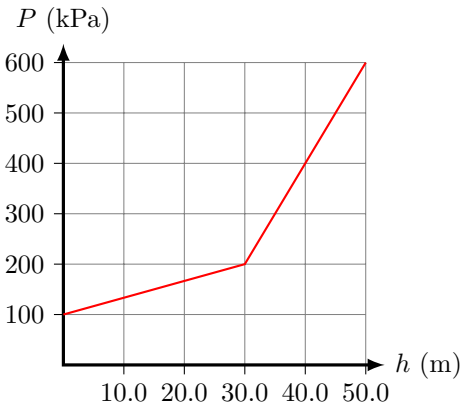
B.

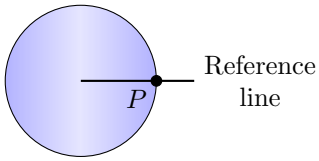

A
B

C.

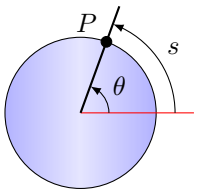

A
B

D.

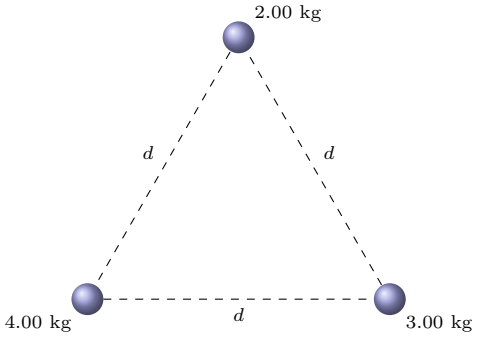

P (kPa)
600
500
400
300
200
100
h (m)
10.0
20.0
30.0
40.0
50.0

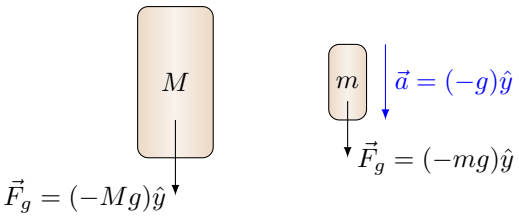

P
Reference
line

(a)


P
s
θ

(b)


2.00 kg
d
d
4.00 kg
d
3.00 kg


M
$\vec{F}_g = (-Mg)\hat{y}$
m
$\vec{a} = (-g)\hat{y}$
$\vec{F}_g = (-mg)\hat{y}$