Phy 4A 9/30

Friday, September 30, 2016 10:00 AM

Goals for the Lecture:

1) Be able to solve 1-D kinematics problems (constant acceleration) using the equations and a graphical approach

2) Review vector addition

worksheet p. 23

Top:

$\vec{A} = \vec{P} - \vec{Q} - \vec{R}$

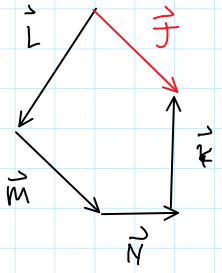
$\vec{B} = \vec{P} + \vec{Q} + \vec{R}$

$\vec{C} = -\vec{P} - \vec{Q} + \vec{R}$

$\vec{D} = \vec{P} - \vec{Q} + \vec{R}$

$\vec{E} = -\vec{P} + \vec{Q} + \vec{R}$

Bottom:

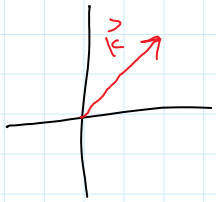


D

p. 28

$\vec{K} = \vec{A} + \vec{B} + \vec{C} + \vec{D}$

	Components x	y
A	−2	3
B	2	−2
C	−1	0
D	3	1
K	−2+2−1+3 = 2	3−2+0+1 = 2



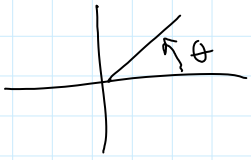
$\vec{N} = \vec{E} - \vec{F} - \vec{G} + \vec{H}$

	x	y
E	0	3
F	-2	-3
G	3	-2
H	1	0
N		

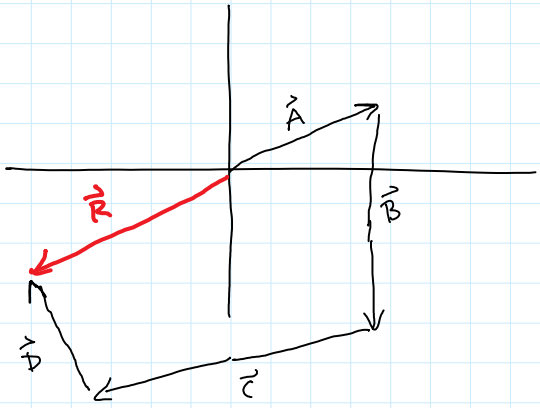
$N_x = 0 - (-2) - 3 + 1 = 0$

$N_y = 3 - (-3) - (-2) + 0 = 8$

Find $\vec{R} = \vec{A} + \vec{B} + \vec{C} + \vec{D}$



	Force	Direction
$\vec{A}$	100	30°
$\vec{B}$	150	270°
$\vec{C}$	200	200°
$\vec{D}$	100	120°



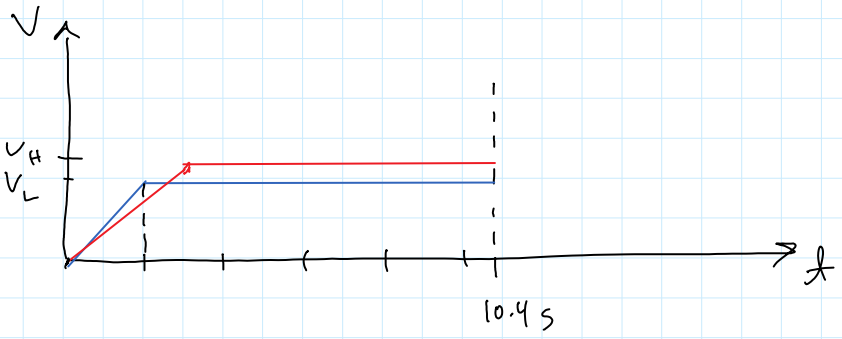
	X comp	y comp
A	$100 \cos 30^\circ$	$100 \sin 30^\circ$
B	0	-150
C	$-200 \cos 20^\circ$	$-200 \sin 20^\circ$
D	$-100 \sin 30^\circ$	$100 \cos 30^\circ$
$\vec{R} = \vec{A}+\vec{B}+\vec{C}+\vec{D}$	$A_x + B_x + C_x + D_x$	$A_y + B_y + C_y + D_y$

Book Prob 2-83

100 m Race

L → 2 s to reach $(V_{max})_L$

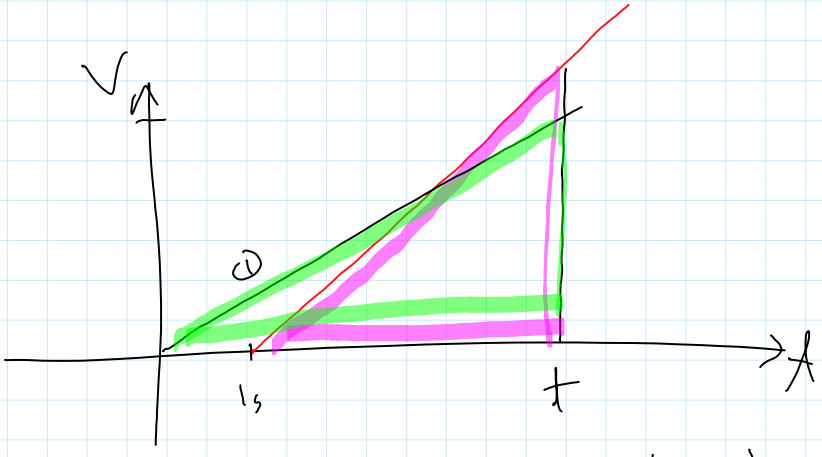
H → 3 s to reach $(V_{max})_H$



Area under curve is same for both (100 m)

$$L: \quad \frac{1}{2}(2\,s)\,V_L + (10.4 - 2)\,V_L = 100\ m$$

$$V_L = 10.6\ \frac{m}{s}$$



Areas are equal at same distance

$$\frac{1}{2}\,t\,(V_{max})_1 = \frac{1}{2}(t-1)(V_{max})_2$$

$$\frac{1}{2}\,t\,(\overset{0}{v_i} + a_1 t) = \frac{1}{2}(t-1)(a_2 t)$$

solve for t