

# Vector Addition, Subtraction & Scalar Mult.

a.  $2\vec{v}_0 = 4.0 \text{ m/s}$  [22° above -x]


b.  $\vec{v}_0 t = 12 \text{ m}$  [22° above -x]

c.  $\frac{1}{2} a t^2 = 9.0 \text{ m}$  [77° below -x]

d.  $-\vec{v}_0 = 4.0 \text{ m/s}$  [22° below +x]

2. a.  $\vec{v}_0 t = 6.0 \text{ m}$  [s]

b.  $-\vec{v}_0 = 3.0 \text{ m/s}$  [N]

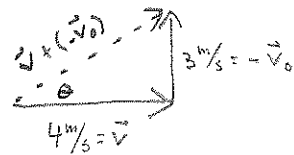
c.  $\vec{v} + (-\vec{v}_0)$  

$\vec{v} + (-\vec{v}_0) = 5 \text{ m/s}$  [37° N of E]

d.  $\vec{v} - \vec{v}_0 = \vec{v} + (-\vec{v}_0) = 5 \text{ m/s}$  [37° N of E]

e.  $\Delta \vec{v} = \vec{v} - \vec{v}_0 = 5 \text{ m/s}$  [37° N of E]

f.  $\vec{a} = \frac{\Delta \vec{v}}{t} = 2.5 \text{ m/s}^2$  [37° N of E]

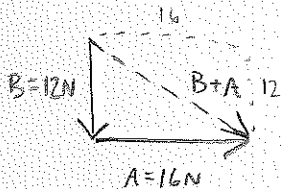


3. a.  $\vec{A} + \vec{B}$



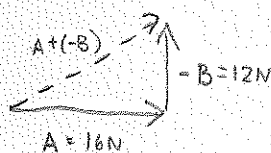
$\vec{A} + \vec{B} = 20 \text{ N}$  [37° below +x]

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



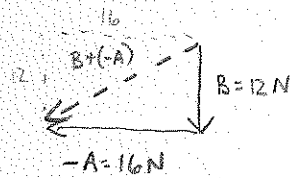
$\vec{B} + \vec{A} = 20 \text{ N}$  [37° below +x]

c.  $\vec{A} - \vec{B} = \vec{A} + (-\vec{B})$



$\vec{A} - \vec{B} = 20 \text{ N}$  [37° above +x]

d.  $\vec{B} - \vec{A} = \vec{B} + (-\vec{A})$



$\vec{B} - \vec{A} = 20\text{N} [37^\circ \text{ below } -x]$

e.  $\vec{C} + \vec{D}$  can't be added, different dimension!

f.  $\vec{D} + \vec{E}_t$

$\vec{E}_t = 4.0\text{m/s} [37^\circ \text{ below } +x]$



	$\hat{x}$	$\hat{y}$
$\vec{D}$	$+8\cos 14$	$+8\sin 14$
$\vec{E}_t$	$+4\cos 37$	$-4\sin 37$
$\vec{D} + \vec{E}_t$	$10.95690785$	$-0.471889128$



$\vec{D} + \vec{E}_t = 11\text{m/s} [2.5^\circ \text{ below } +x]$

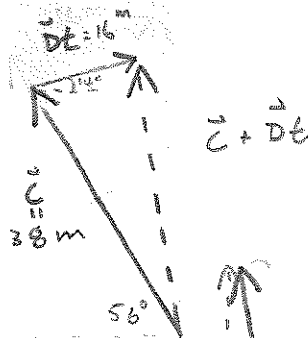
g. NOPE!

h. NUH-UH!

i.  $\vec{C} + \vec{D}_t$

$\vec{D}_t = 16\text{m} [14^\circ \text{ above } +x]$

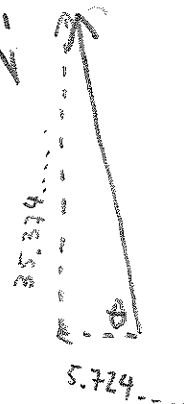
$\vec{C} = 38\text{m} [56^\circ \text{ above } -x]$



	$\hat{x}$	$\hat{y}$
$\vec{C}$	$-38\cos 56$	$+38\sin 56$
$\vec{D}_t$	$+16\cos 14$	$+16\sin 14$

$\vec{C} + \vec{D}_t = -5.7245971 \hat{x} + 35.37417809 \hat{y}$

$\vec{C} + \vec{D}_t = 36\text{m} [81^\circ \text{ above } -x]$



# Vector Algebra

a.  $5.0 \times 10 \text{ N}$  [36° above +x]

b. 31 m [67° below +x]

CAN'T ADD!  
DIMENSIONS ARE DIFFERENT

d.  $9.9 \text{ m/s}$  [67° above -x]

e. 8300 m [13° E of N]

f.  $75 \text{ m/s}$  [13° W of S]

g.  $1.4 \text{ m/s}^2$  [36° below -x]

$\downarrow$   
 $\frac{\text{N}}{\text{kg}} = \frac{\text{m}}{\text{s}^2}$

a.  $1.0 \times 10 \text{ m/s}$  [53° S of E  
(37° E of S)]

b.  $1.0 \times 10 \text{ m/s}$  [53° S of E  
(37° E of S)]

c.  $1.0 \times 10 \text{ m/s}$  [53° N of E]

d.  $1.0 \times 10 \text{ m/s}$  [53° S of W]

e. Impossible

f.  $2.0 \text{ m/s}$  West

g.  $1.0 \times 10 \text{ m/s}$  [53° S of W]

h.  $1.0 \times 10 \text{ m/s}$  [53° N of E]

i.  $0.83 \text{ m/s}$  [53° S of W]

j.  $6.0 \times 10^3 \text{ kg/m/s}$  [1.9° S of E]

k. Impossible

l. 18 m [63° S of W]

