"VECTOR COMPONENTS"
PROBLEMS

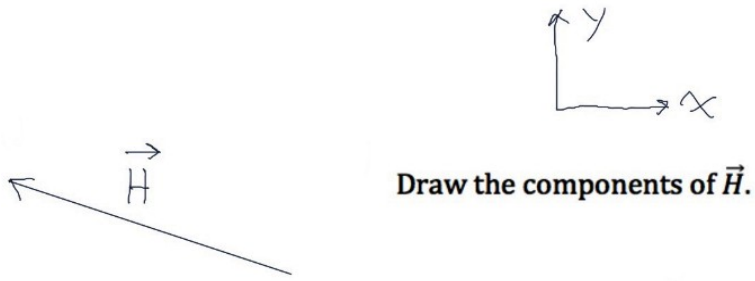
Solutions to these problems are available in the Solutions document, and in the "Vector components" video series.

You can find links to these resources at my website: www.freelance-teacher.com

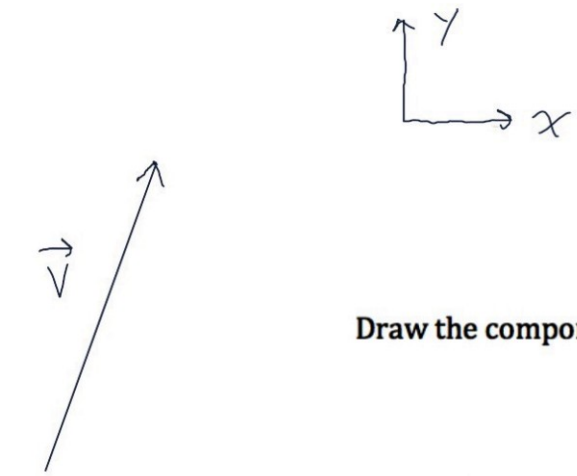
Links to the documents are also in the video description boxes for the YouTube videos.

You can support these resources with a monthly pledge of $1 (or more) at my Patreon page: www.patreon.com/freelanceteacher

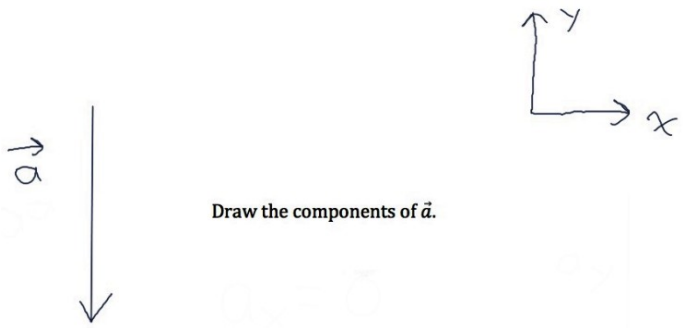
Video (1)



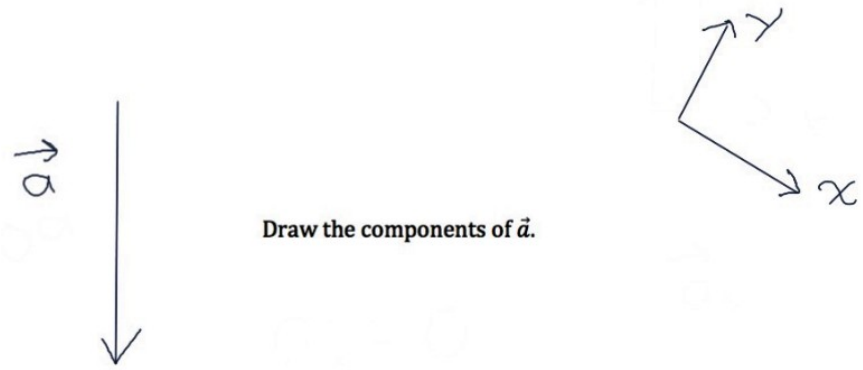
Draw the components of $\vec{H}$.



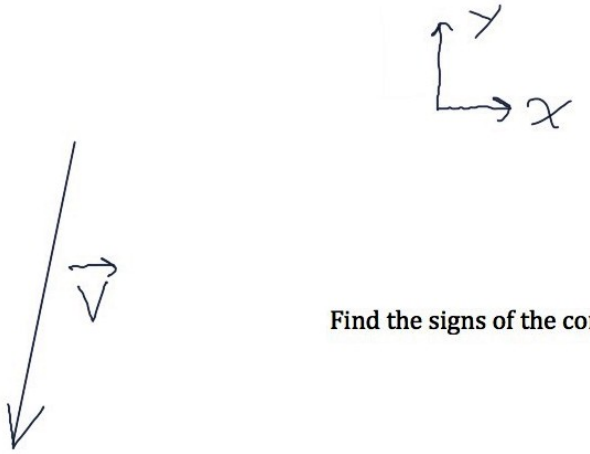
Draw the components of $\vec{v}$.



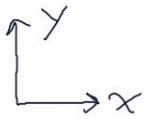
Draw the components of $\vec{a}$.



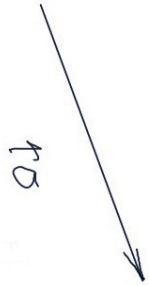
Draw the components of $\vec{a}$.

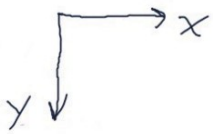


Find the signs of the components of $\vec{v}$.

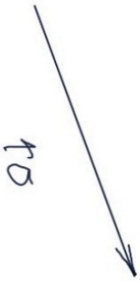


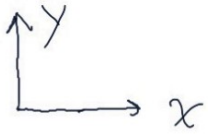
Find the signs of the components of $\vec{a}$.



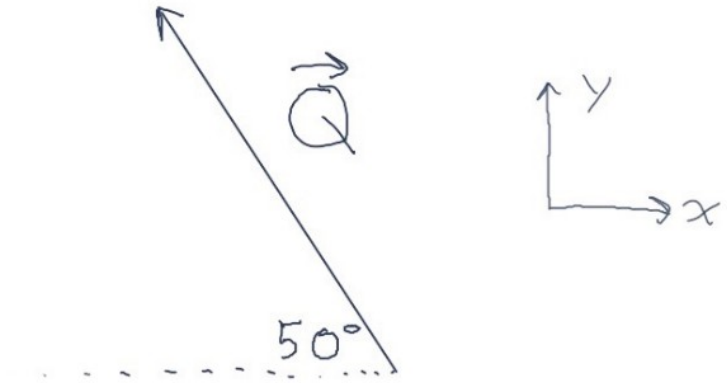


Find the signs of the components of $\vec{a}$.



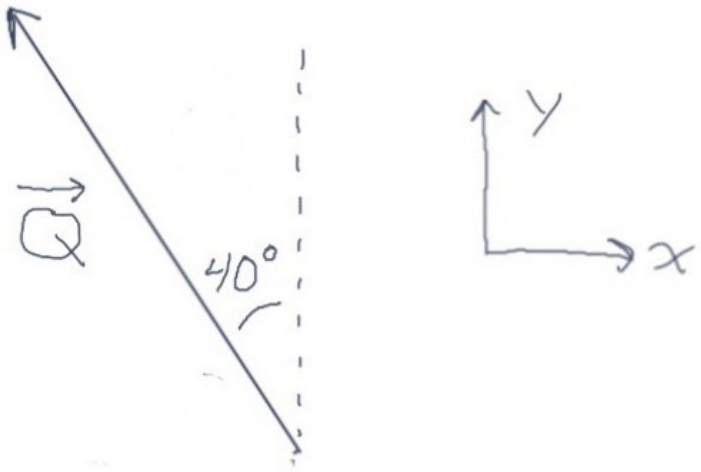


Find the signs of the components of $\vec{F}$.



Vector $\vec{Q}$ has a magnitude of 17 units.
Determine each of the following, if possible.

$\vec{Q}$ = dir $\vec{Q}$ = $\vec{Q}$ arrow: Q =	
Q_x = dir Q_x = Q_x arrow: $\lvert Q_x \rvert$ =	Q_y = dir Q_y = Q_y arrow: $\lvert Q_y \rvert$ =



Vector $\vec{Q}$ has a magnitude of 17 units.
Determine each of the following, if possible.

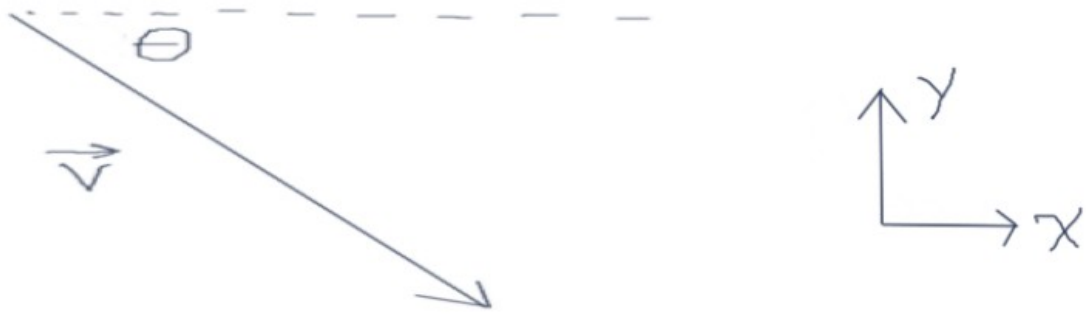
$\vec{Q}$ = dir $\vec{Q}$ = $\vec{Q}$ arrow: Q =	
Q_x = dir Q_x = Q_x arrow: $\lvert Q_x \rvert$ =	Q_y = dir Q_y = Q_y arrow: $\lvert Q_y \rvert$ =

VECTOR COMPONENTS problems for Video (1)

True or false:
"You should use cosine to find *x*-components, and use sine to find *y*-components."

If the sentence is false, try to find one or more useful ways to rephrase the sentence so that it is true.

Problem:

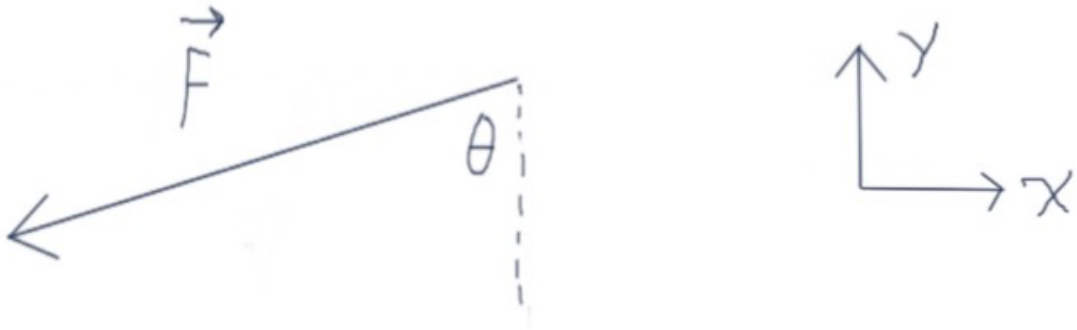


Determine each of the following, if possible.

$\vec{v}$ = dir $\vec{v}$ = $\vec{v}$ arrow: v =	
v_x = dir v_x = v_x arrow: $\lvert v_x \rvert$ =	v_y = dir v_y = v_y arrow: $\lvert v_y \rvert$ =

VECTOR COMPONENTS problems for Video (1)

Problem:



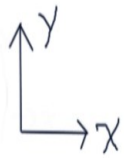
Determine each of the following, if possible.

$\vec{F}$ = dir $\vec{F}$ = $\vec{F}$ arrow: F =	
F_x = dir F_x = F_x arrow: $\lvert F_x \rvert$ =	F_y = dir F_y = F_y arrow: $\lvert F_y \rvert$ =

True or false:
"You should use cosine to find *x*-components, and use sine to find *y*-components."

If the sentence is false, try to find one or more useful ways to rephrase the sentence so that it is true.

Problem:



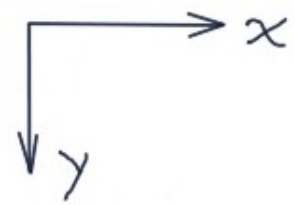
Vector $\vec{v}$ points left with magnitude 8 m/s.
Determine each of the following, if possible.

$\vec{v}$ = dir $\vec{v}$ = $\vec{v}$ arrow: v =	
v_x = dir v_x = v_x arrow: $\lvert v_x \rvert$ =	v_y = dir v_y = v_y arrow: $\lvert v_y \rvert$ =

Problem:

Determine each of the following, if possible.

$\vec{F}$ = dir $\vec{F}$ = $\vec{F}$ arrow: F =	
F_x = dir F_x = F_x arrow: $\lvert F_x \rvert$ =	F_y = dir F_y = F_y arrow: $\lvert F_y \rvert$ =



Determine each of the following, if possible.

$\vec{F}$ = dir $\vec{F}$ = $\vec{F}$ arrow: F =	
F_x = dir F_x = F_x arrow: $\lvert F_x \rvert$ =	F_y = dir F_y = F_y arrow: $\lvert F_y \rvert$ =

VECTOR COMPONENTS problems for Video (1)

Problem:

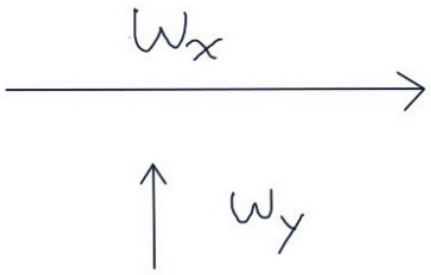
Vector $\vec{a}$ has a magnitude of 0.
Determine each of the following, if possible.

$\vec{a}$ =	
dir $\vec{a}$ =	
$\vec{a}$ arrow:	
a =	
a_x =	a_y =
dir a_x =	dir a_y =
a_x arrow:	a_y arrow:
$\lvert a_x \rvert$ =	$\lvert a_y \rvert$ =

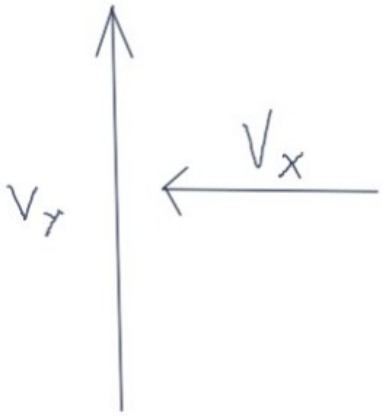
Video (2)

Problem:

Draw $\vec{w}$.

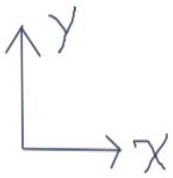


Problem:



Draw $\vec{v}$.

Problem:

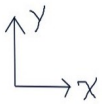


u_x = -4 units and u_y = 7 units.
Determine each of the following, if possible.

$\vec{u}$ = dir $\vec{u}$ = $\vec{u}$ arrow: u =	
u_x = dir u_x = u_x arrow: $\lvert u_x \rvert$ =	u_y = dir u_y = u_y arrow: $\lvert u_y \rvert$ =

VECTOR COMPONENTS problems for Video (2)

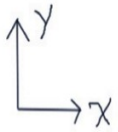
Problem:



v_x = 3 m/s and v_y = -5 m/s.
Determine each of the following, if possible.

$\vec{v}$ = dir $\vec{v}$ = $\vec{v}$ arrow: v =	
v_x = dir v_x = v_x arrow: $\lvert v_x \rvert$ =	v_y = dir v_y = v_y arrow: $\lvert v_y \rvert$ =

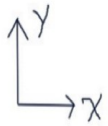
Problem:



$v_x = -k$, and $v_y = q$, where k and q are both positive.
Determine each of the following, if possible:

$\vec{v}$ = dir $\vec{v}$ = $\vec{v}$ arrow: v =	
v_x = dir v_x = v_x arrow: $\lvert v_x \rvert$ =	v_y = dir v_y = v_y arrow: $\lvert v_y \rvert$ =

Problem:

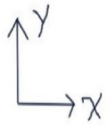


$a_y = -8 \frac{\text{m/s}}{\text{s}}$, $a_x = 0$.

Determine each of the following, if possible.

$\vec{a}$ = dir $\vec{a}$ = $\vec{a}$ arrow: a =	
a_x = dir a_x = a_x arrow: $\lvert a_x \rvert$ =	a_y = dir a_y = a_y arrow: $\lvert a_y \rvert$ =

Problem:



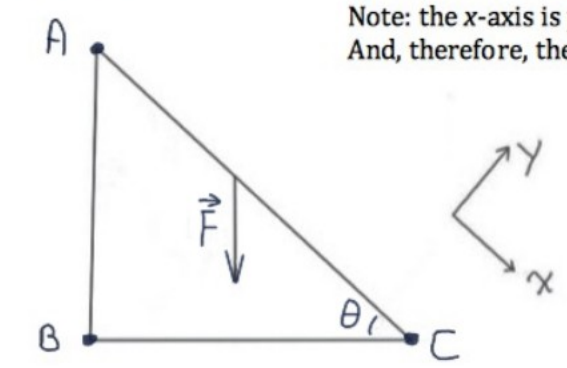
Given: $a_y = 0$, $a_x = 0$

Determine each of the following, if possible.

$\vec{a}$ = dir $\vec{a}$ = $\vec{a}$ arrow: a =	
a_x = dir a_x = a_x arrow: $\lvert a_x \rvert$ =	a_y = dir a_y = a_y arrow: $\lvert a_y \rvert$ =

Video (3)

Problem:

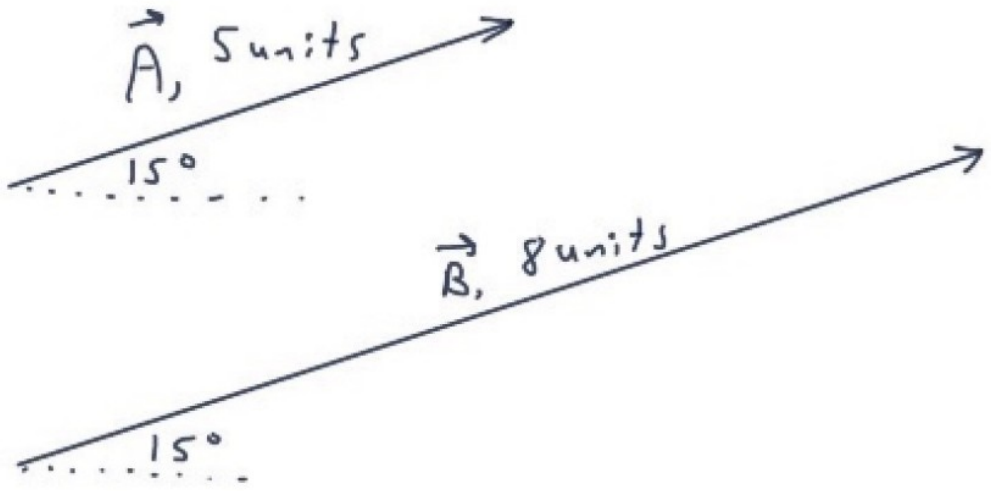


Note: the x-axis is parallel to line segment AC.
And, therefore, the y-axis is perpendicular to line segment AC.

Determine each of the following, if possible.

$\vec{F}$ = dir $\vec{F}$ = $\vec{F}$ arrow: F =	
F_x = dir F_x = F_x arrow: $\lvert F_x \rvert$ =	F_y = dir F_y = F_y arrow: $\lvert F_y \rvert$ =

Video (4)



Problem:

Suppose that $\vec{A}$= "magnitude 5 units, at an angle of 15° as shown". And suppose that $\vec{B}$= "magnitude 8 units, also at an angle of 15° as shown".

Suppose $\vec{C} = \vec{A} + \vec{B}$.

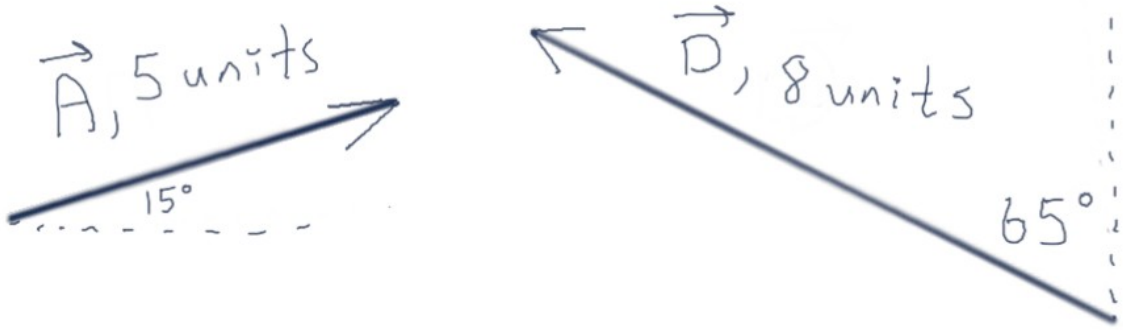
What is the magnitude and direction of $\vec{C}$?

Problem:

Suppose that $\vec{A}$= "magnitude 5 units, at an angle of 15° as shown". And suppose that $\vec{D}$= "magnitude 8 units, at an angle of 65° as shown".

Suppose $\vec{E} = \vec{A} + \vec{D}$.

What is the magnitude and direction of $\vec{E}$?



True or false? If the sentence is false, reword it to be true.
"To add vectors, add their magnitudes."

True or false? If the sentence is false, reword it to be true.
"You should use cosine to find *x*-components, and use sine to find *y*-components."

Video (5)

SUMMARY
fill in the blanks

How to draw the components of a vector:

Every nonzero component has two parts:

A “magnitude” is:

If a vector is parallel or anti-parallel to the *x*-axis, then:

A similar pattern holds when a vector is parallel or anti-parallel to the *y*-axis.

To draw the overall vector, based on the components:

To add nonparallel vectors, do **not** add their magnitudes.
Instead:

VECTOR COMPONENTS problems for Video (5)

SUMMARY continued
fill in the blanks

What exactly do each of the symbols in the following table mean?

symbols for describing a vector $\vec{A}$

$\vec{A}$ = dir $\vec{A}$ = A =	
A_x = dir A_x = $\lvert A_x \rvert$ =	A_y = dir A_y = $\lvert A_y \rvert$ =