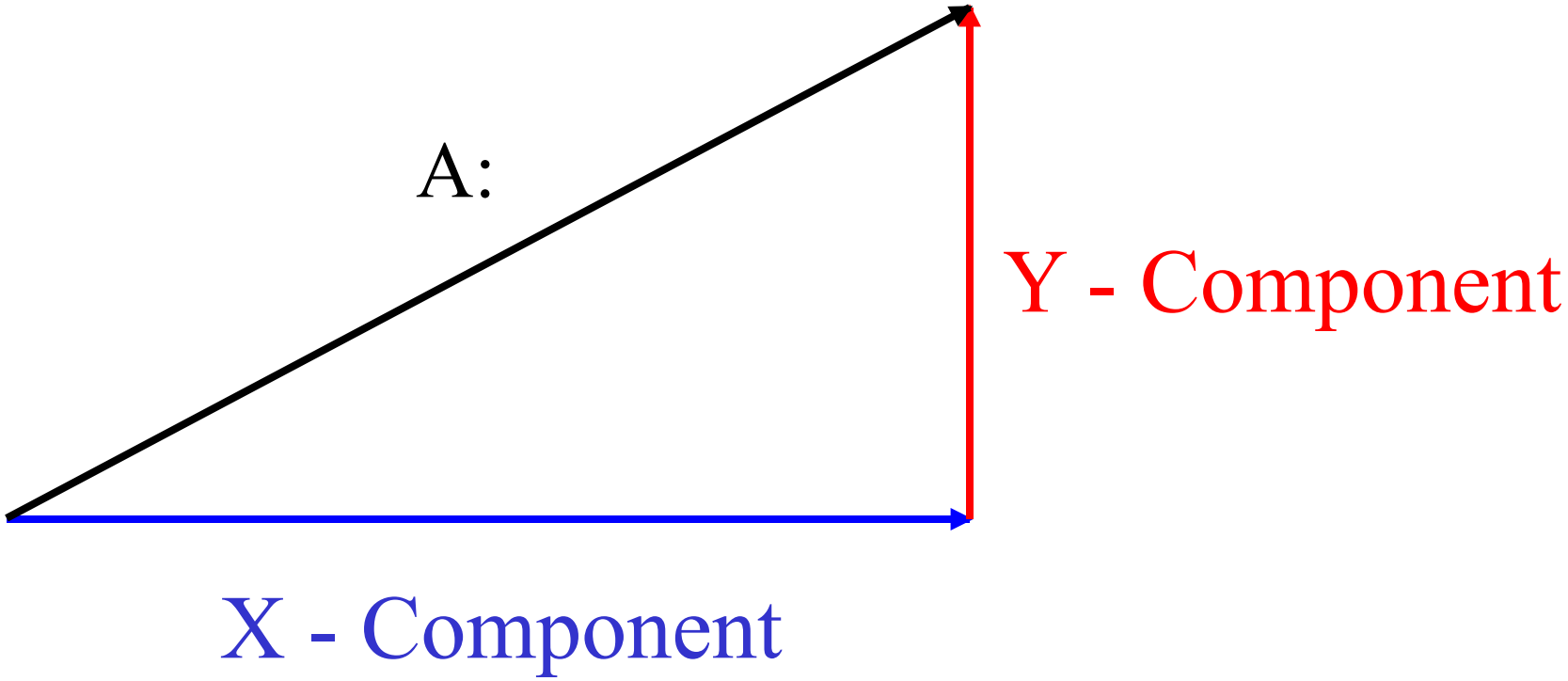
Vectors - Finding Vector Components

Contents:

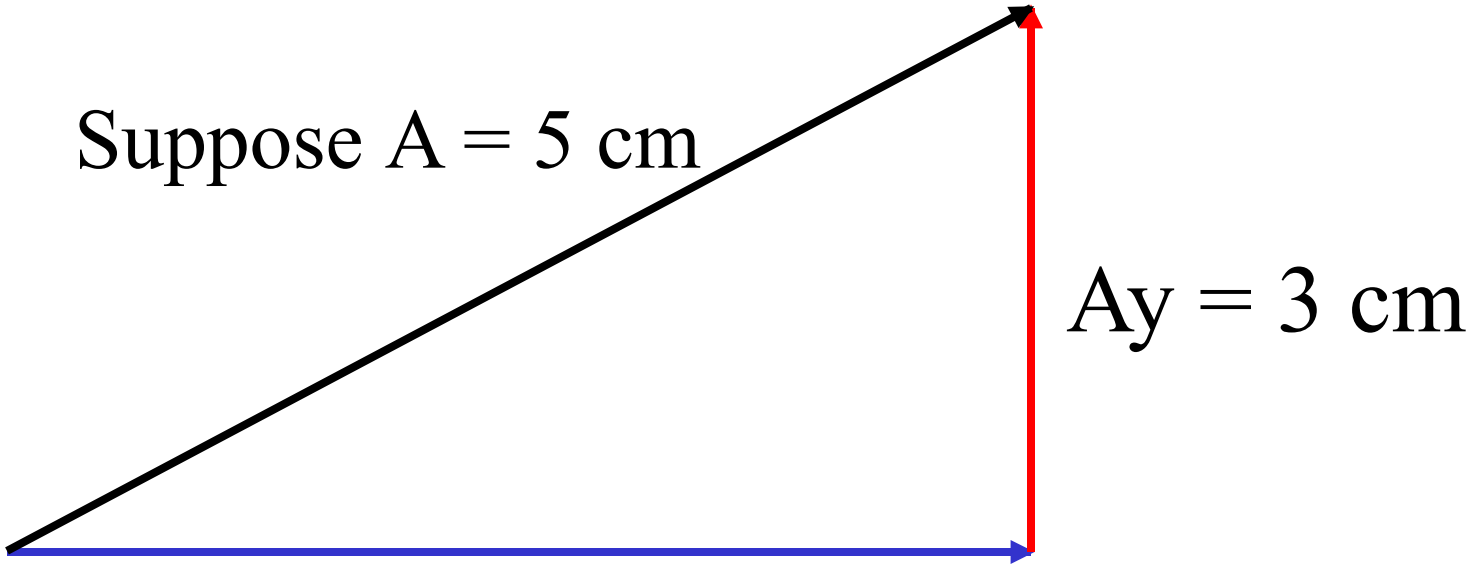
- Definition of vector components
- Whiteboards: Writing the notation
- How to find components
- Whiteboard Am to VC

Vectors - What components are



TOC

Vectors - What components are



$A = 4 \text{ cm } \hat{x} + 3 \text{ cm } \hat{y}$

(This is how you write it)

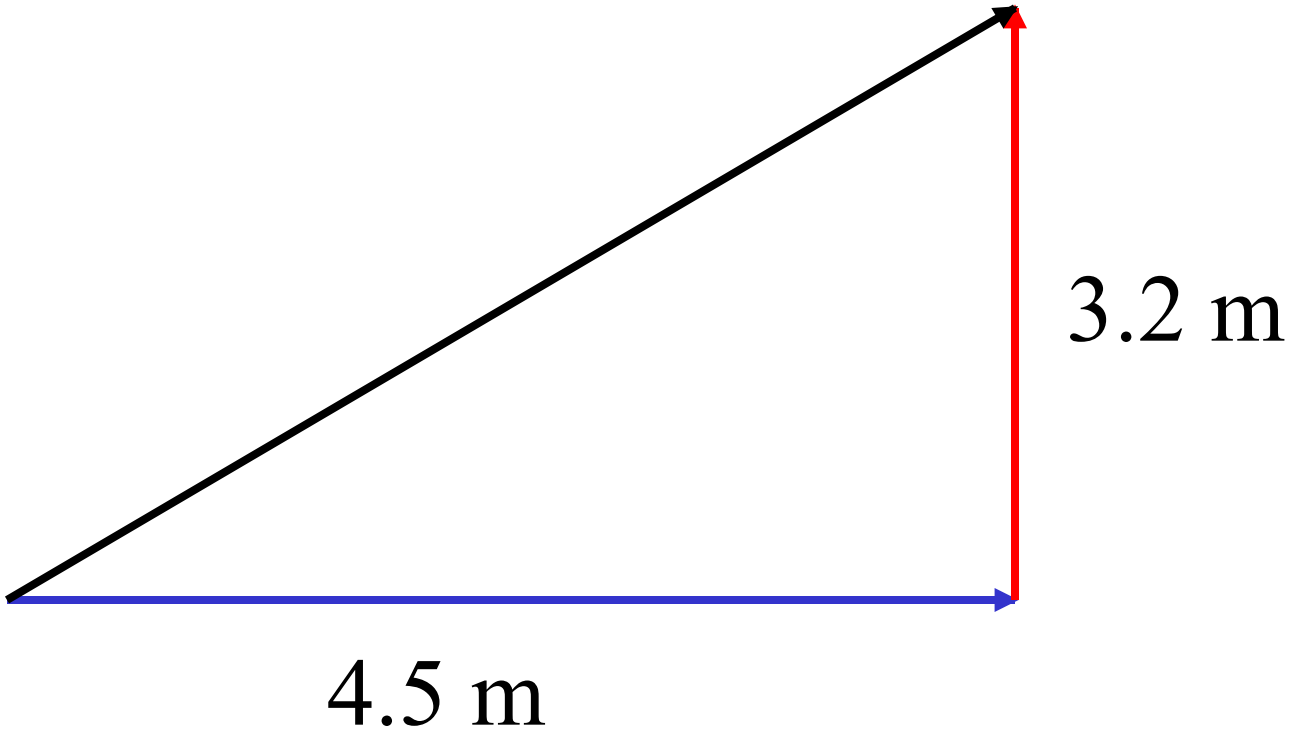
TOC

Whiteboards:

Writing the notation

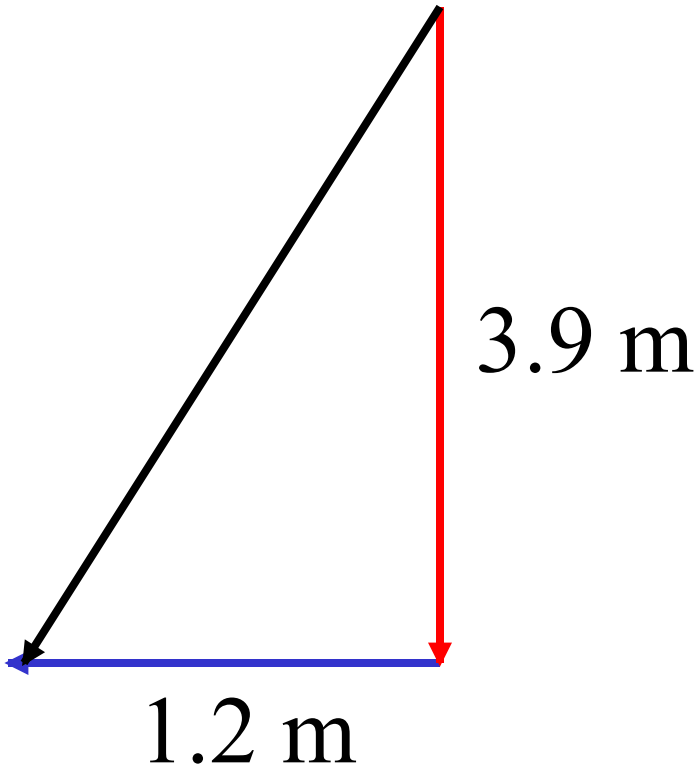
1 | 2 | 3

TOC



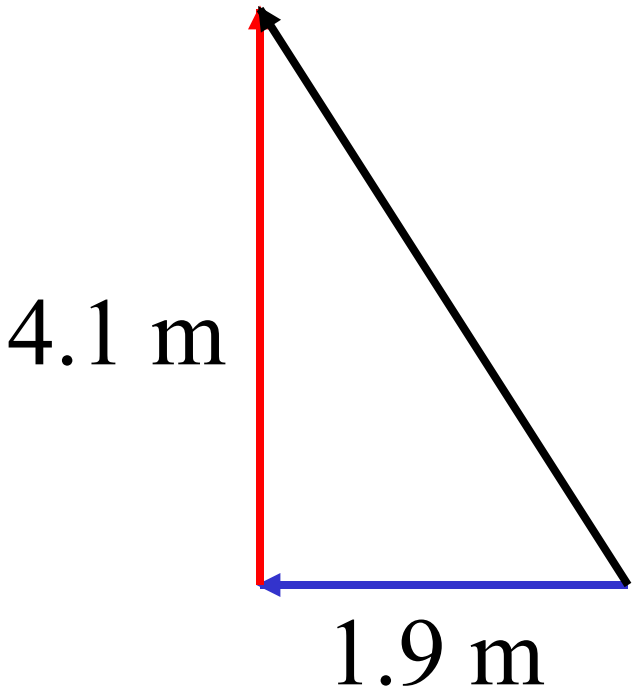
4.5 m x + 3.2 m y

W



-1.2 m x + -3.9 m y

W

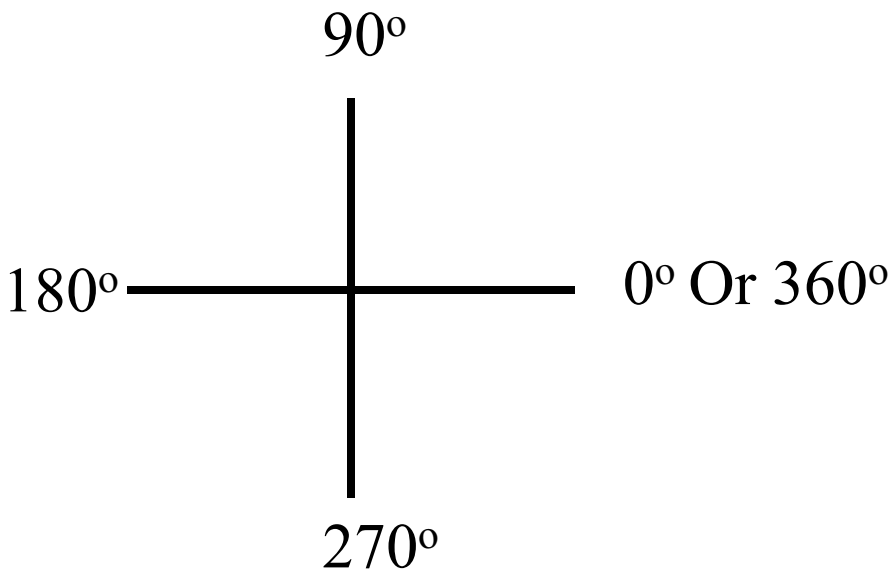


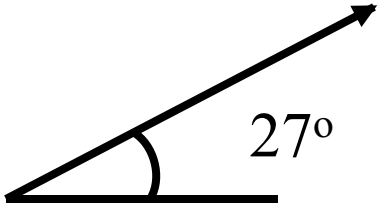
-1.9 m x + 4.1 m y

W

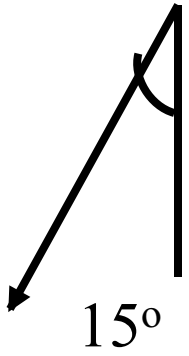
Vectors - Finding Components - step by step

Step 1: Find the Trig angle – ACW from x axis

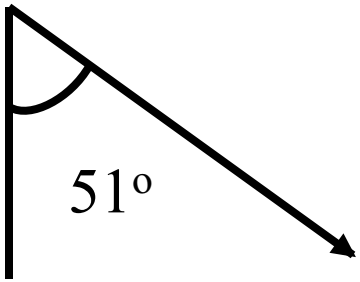




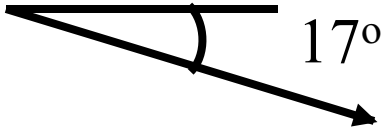
This is the trig angle



$\theta_T = 270 - 15 = 255^o$



$\theta_T = 270 + 51 = 321^o$



$\theta_T = 360 - 17 = 343^o$
OR
$\theta_T = -17^o$

TOC

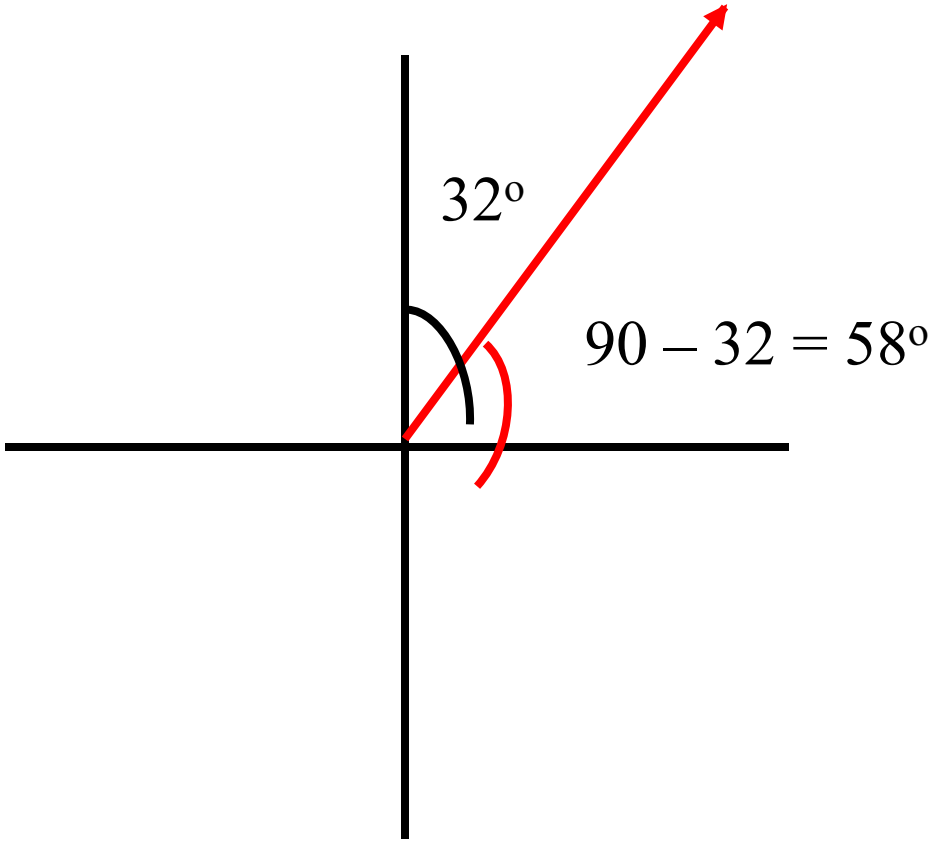
Whiteboards:

Getting the trig angle

1 | 2 | 3 | 4 | 5 | 6

TOC

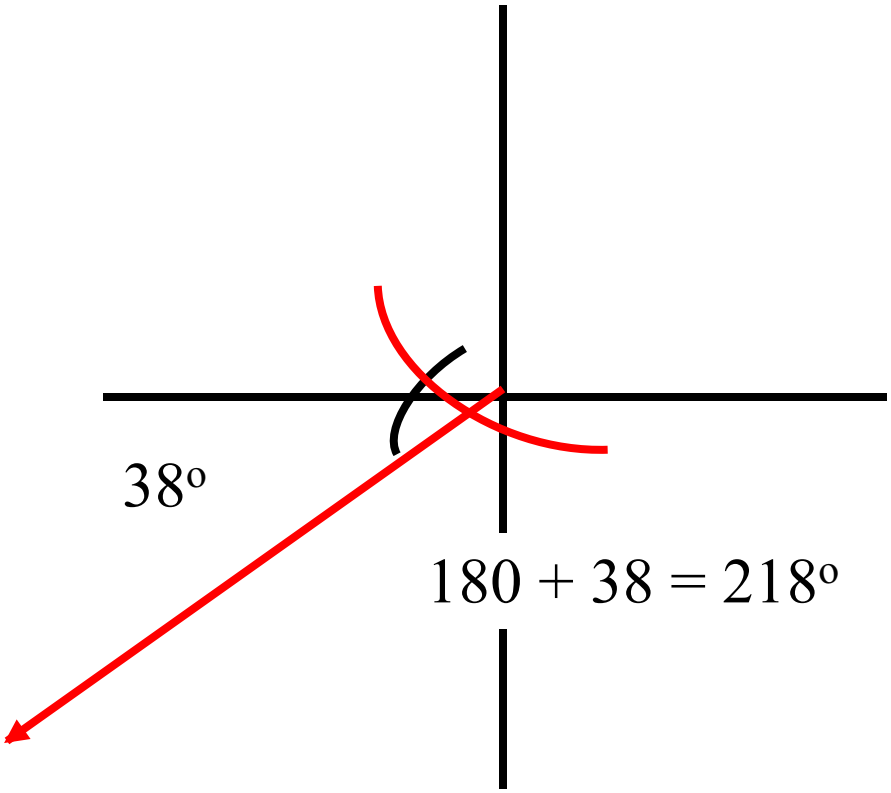
What's the Trigonometric angle?



58°

W

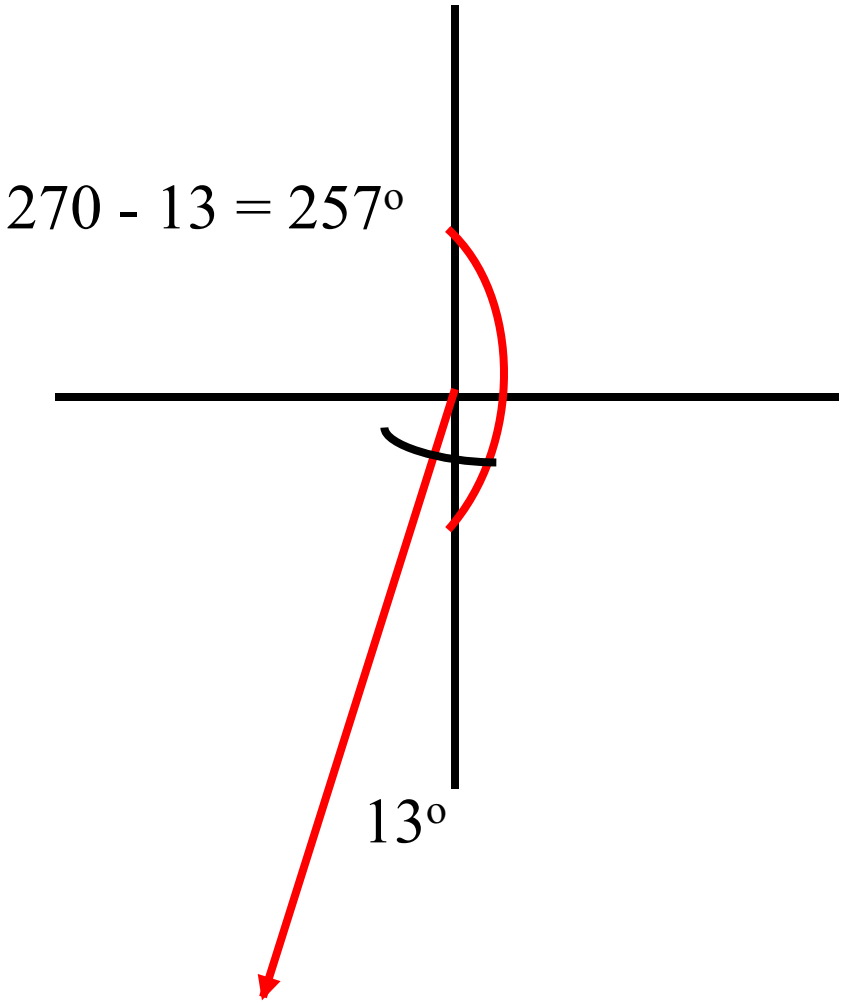
What's the Trigonometric angle?



218°

W

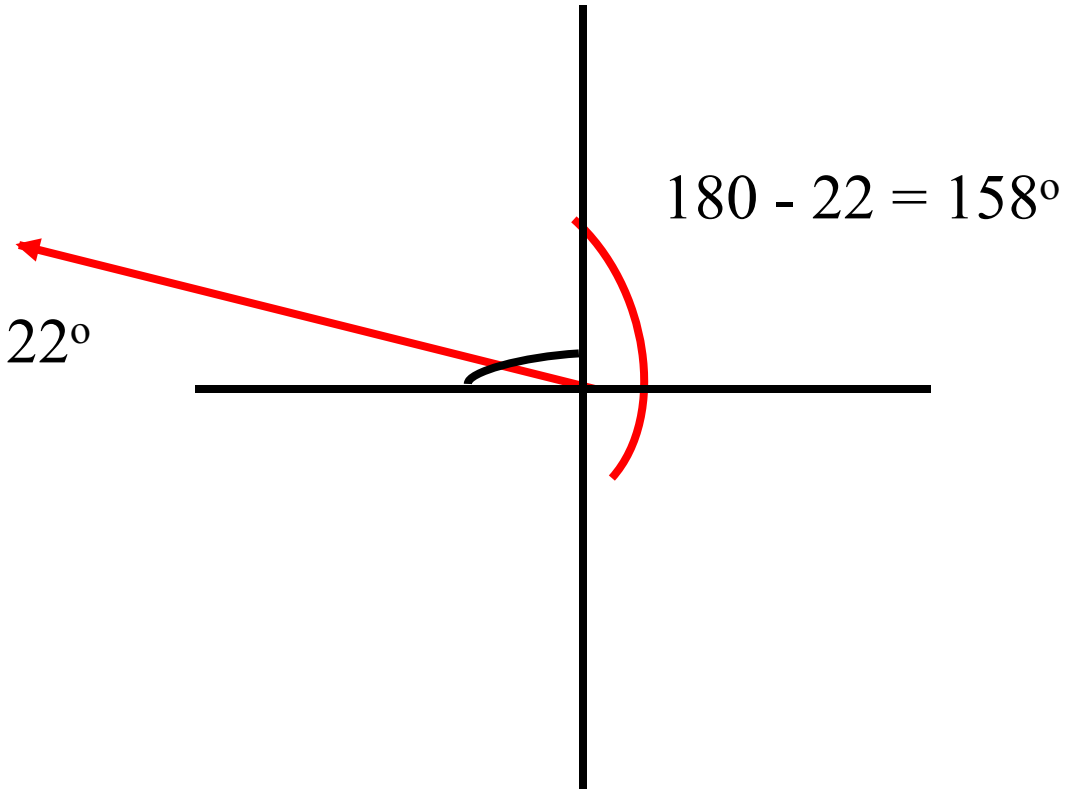
What's the Trigonometric angle?



257°

W

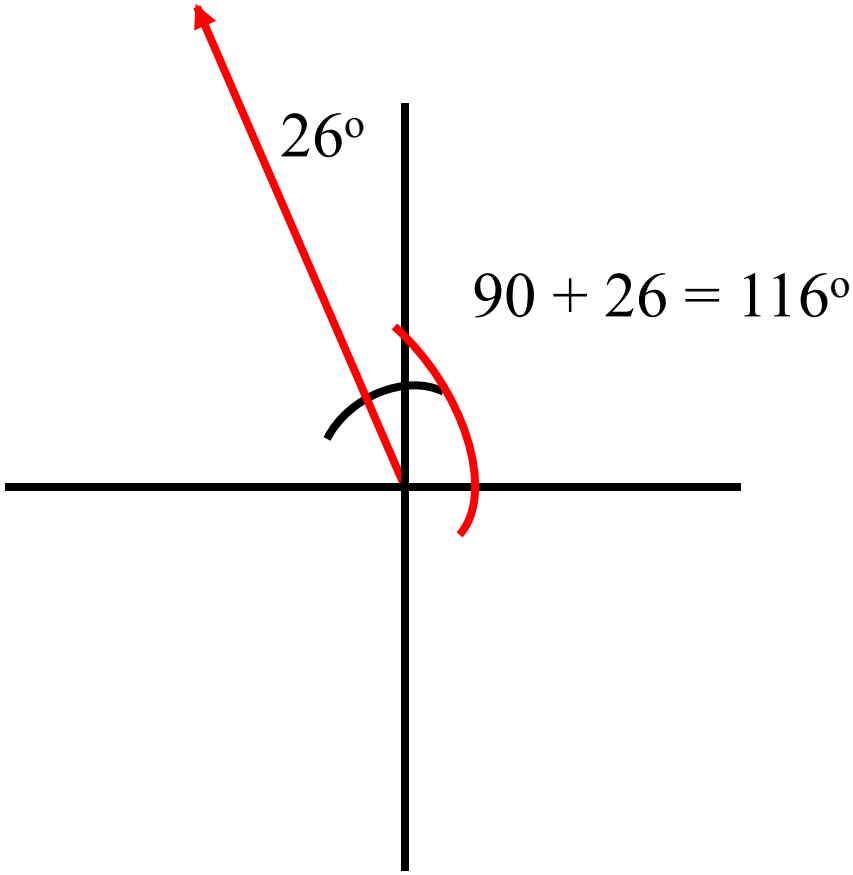
What's the Trigonometric angle?



158°

W

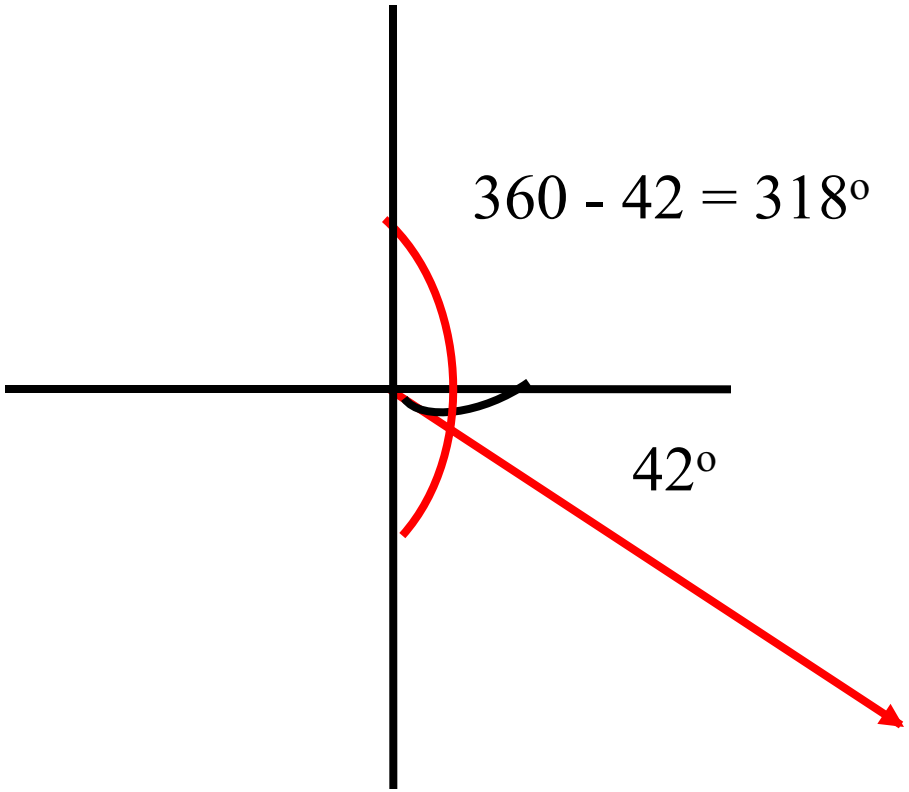
What's the Trigonometric angle?



116°

W

What's the Trigonometric angle?



318°

W

Vectors - Try this yourself

Get out your calculator

type:

sin 90 <ENTER>

1????

If not

<2nd?> MODE

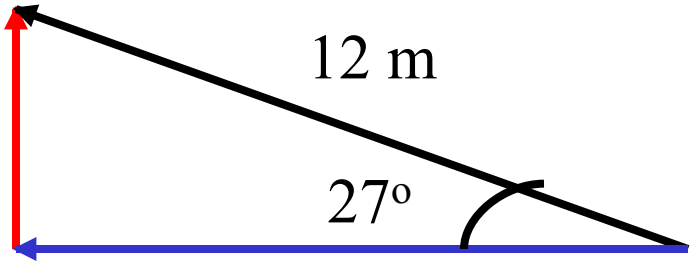
Cursor arrows to “Degree”

<ENTER> <CLEAR>

Try again (sin 90)

TOC

Vectors - Finding Components - step by step



$\theta = 180^o - 27^o = 153^o$

$x = (12\text{ m})\text{Cos}(153^o) = -10.692\text{ m}$

$y = (12\text{ m})\text{Sin}(153^o) = +5.448\text{ m}$

Step 2: Figure the sides using Cos and Sin:

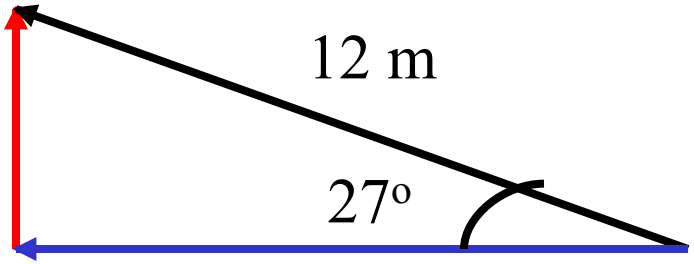
x = mag Cos(θ)

y = mag Sin(θ)

(iff θ = trig angle)

TOC

Vectors - Finding Components - step by step



Step 3: Write it in Vector Component notation:

Vector = -11 m x + 5.4 m y (With sig figs)

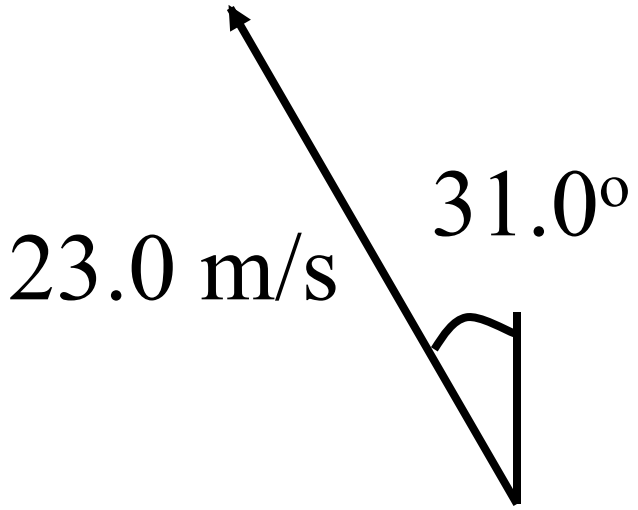
Reality Check:

(+ and -),

relative size

TOC

Vectors - Try this yourself



1. Draw the Components
2. Figure the components with sin and cos
3. Write the answer in VC Notation

$\theta = 90 + 31 = 121^o$
$23\cos(121)\ x + 23\sin(121)\ y$
$-11.846\ x \quad + 19.715\ y$

-11.8 m/s x + 19.7 m/s y

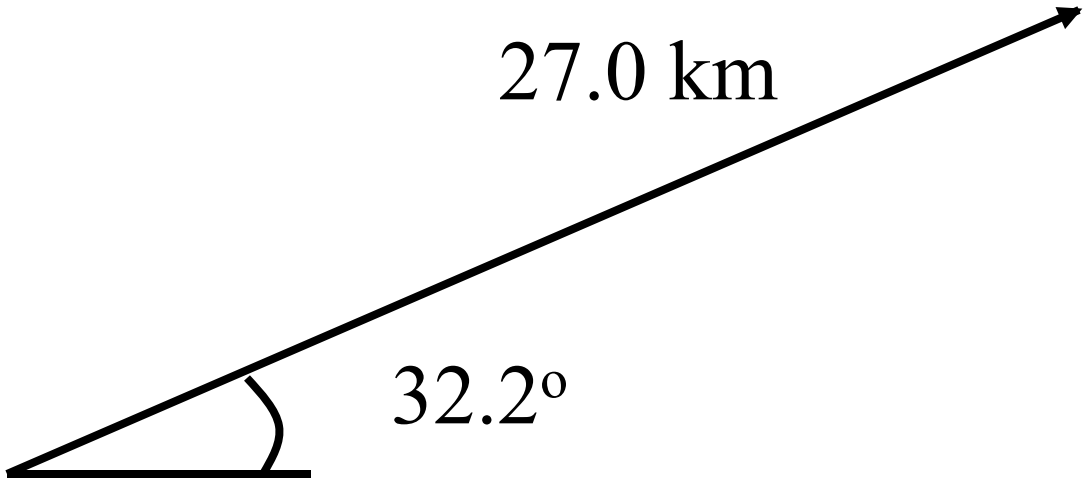
TOC

Whiteboards:

AM to VC

1 | 2 | 3 | 4 | 5

TOC



$\theta = 32.2^{o}$

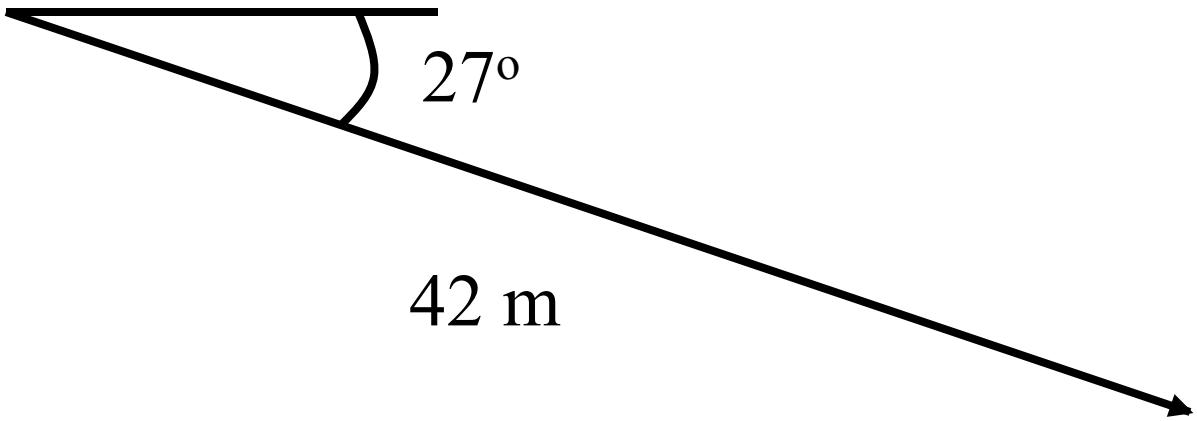
$27.0\cos(32.2)\ x + 27.0\sin(32.2)\ y$

22.84721549 14.38765945

22.8 km x + 14.4 km y

22.8 km x + 14.4 km y

W



$\theta = 360 - 27 = 333^o$

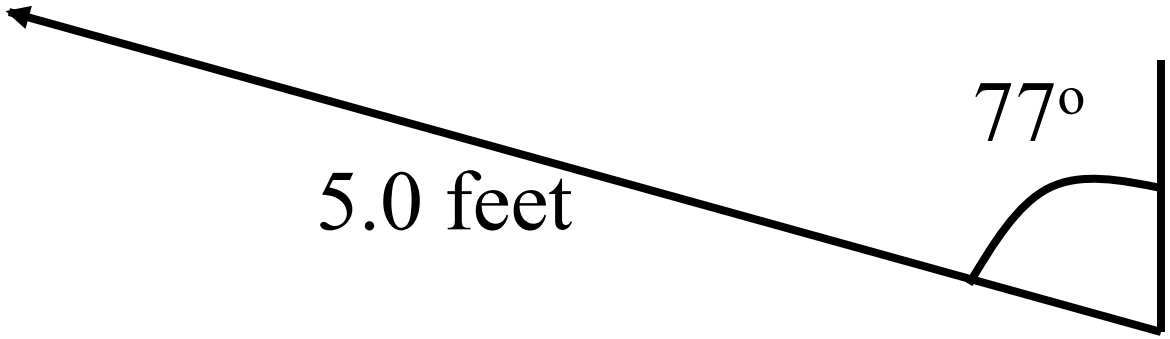
42cos(333) x + 42sin(333) y

37.42227402 -19.06760099

37 m x + -19 m y

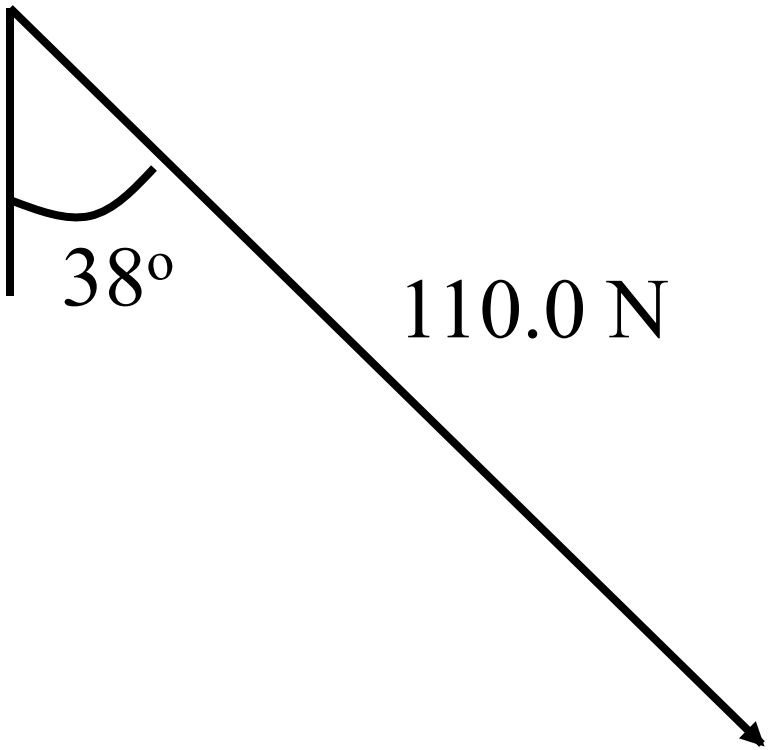
37 m x + -19 m y

W



$\theta = 90 + 77 = 167^{o}$

5cos(167) x	+	5sin(167) y
-4.871850324		1.124755272
-4.9 ft x	+	1.1 ft y



$\theta = 270 + 38 = 308^{o}$

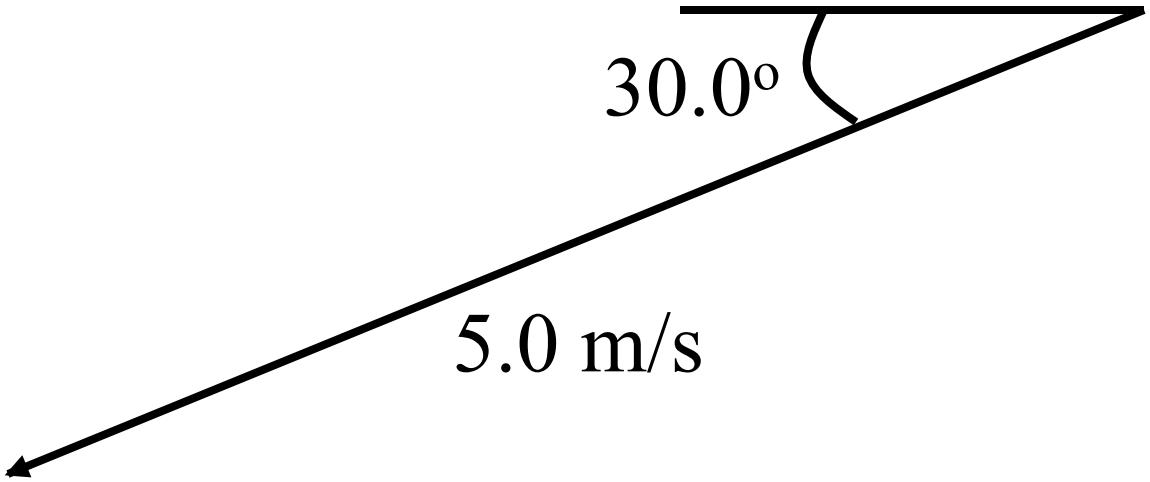
110.0cos(308) x + 110.0sin(308) y

67.72276229-86.6811829

68 N x + -87 N y

68 N x + -87 N y

W



$\theta = 180 + 30.0 = 210.0^{o}$

5.0cos(210.0) x + 5.0sin(210) y

-4.330127019 -2.5

-4.3 m/s x + -2.5 m/s y